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War and Steel and Metal-Working Trades

GOVERNMENT MAKING VERY LARGE PURCHASES FOR THE ARMY AND NAVY

Agreement with Steel Producers at Low Prices—New Deal for Centralizing Munitions Buying—Billions to Be Invested in the Coming Year—Co-Operation of Engineers

The Government's demands upon the steel and metal-working industries in all their ramifications have been among the chief developments of the week in the program for this country's participation in the war. The first tentative estimate of army and navy requirements of the coming year puts the outlay at more than $3,500,000,000, which is altogether apart from the $3,000,000,000 of bonds which it is now proposed the Government shall issue to aid in financing the Allies' requirements in this market.

It is now expected that the Government will promptly call on various plants that have completed shell and other munitions contracts for Europe to take on orders for our own army and navy.

The Council of National Defense, in order to secure economy in munitions purchases and the promptest and most efficient service to the Government, has put these in the hands of a general munitions board, headed by a well-known manufacturer, as is indicated in detail below.

Metal-working companies in New England and other parts of the country look for increased activity as the demands of the Government take shape, and capacity that was occupied on recently expired contracts for the Allies will again be taken up with munitions work.

In New York members of various engineering societies are co-operating for Government service, their most definite activity being the organization of an engineer regiment.

Great Impetus to Metal Trades Preparations

WASHINGTON, April 10, 1917.—The passage by Congress of the resolution declaring a state of war to exist between the United States and Germany followed closely by the President's proclamation and the submission to Congress by the Secretary of the Treasury of estimates for appropriations to carry on the war aggregating $3,500,000,000 for the first year, apart from the $3,000,000,000 of bonds to cover credits to the Allies, have given a tremendous impetus to war preparations. The bill framed by the general staff of the army providing for the recruiting and equipment of a large force in installments of 500,000 men each has already been framed and within a few days detailed estimates will be submitted to the Congressional committees, indicating, at least in a general way, the disposition which the executive departments desire to make of the enormous sum contemplated in Secretary McAdoo's budget.

Large Contracts to Munitions Plants

A problem to which the ordnance experts of the War Department are giving close attention is the best method of distributing the large orders for war material essential to the Administration's big preparedness program among existing private munitions plants so as to aid in maintaining the efficiency of as many of them as possible. In this connection the officials have read with interest the editorial in THE IRON AGE of last week on the "Necessity for Military Census," and give it unqualified approval. As reported in this correspondence from time to time, both War and Navy departments, during the past four or five months, have received many communications from manufacturers of munitions stating that their foreign contracts were rapidly being completed and that unless they would receive assurances that the Government would place orders with them in the near future they would be obliged to sell or scrap their equipment. In a few cases the departments have been able to place comparatively small orders and the Ordnance Bureau of the War Department has been working out a project under the terms of the last army appropriation act for the placing of special equipment in a few private plants for the production of small arms. The total amount of Government business thus furnished, however, has been negligible compared with the capacity of the plants working on foreign orders, and the officials have realized that there was great danger not only that many manuafacturers would abandon the making of war material, but that their valuable organizations, representing both time and money, would soon be disrupted.

It is now probable that systematic use will be made by the Government of a large number of favorably located and well equipped munitions plants and that contracts running into many millions of dollars will speedily be placed. In anticipation of the situation now confronting the country, the War Department more than a

year ago made a careful canvass of all the manufacturing concerns in the United States capable of producing any considerable quantity of war material, either with existing equipment or with such changes as might be made without great expenditure of time or money. In taking this census the War Department secured a schedule of the prospective output of all these concerns measured in terms of field artillery ammunition and parts thereof. The data thus obtained will now be of great value in distributing orders for war material.

Purchases Without Competition

In this connection the officials earnestly hope that, in appropriating the huge sums estimated for the conduct of the war, all restrictions will be removed as to the manner in which they may be expended. The President already has authority to suspend the eight-hour law, which has been done in certain instances, but specific permission is desired to make purchases without competition, wherever it is to the interest of the Government to do so and to purchase rather than manufacture in Government establishments the bulk of the Nation's requirements. The arsenals are hopelessly inadequate to supply any such army as is in contemplation, and obviously Congress must abandon its time-honored policy of requiring practically all war material to be manufactured by the Government.

Adjusting Steel and Munitions Prices

A highly significant series of conferences between Secretary Daniels, President J. A. Farrell of the United States Steel Corporation, representing the steel industry, and several officials of the E. W. Bliss Company, held during the past week, have been followed by an announcement by the Secretary that, as the result of negotiations, the Government will save at least $18,000,000 in the navy's bill for steel during 1917 and more than $2,000,000 on a single order for torpedoes. In making this announcement the Secretary says that the Bliss Company has agreed to deliver torpedoes at approximately the price paid in 1916 and substantially less than the current price. The Secretary's statement, referring to section 8 of the last naval appropriation act, says:

"The result of invoking this new provision of the naval bill has saved the department $2,193,696 on one order. We expect all munition makers to furnish the Government what it needs at prices which investigation shows to be reasonable, so that it will not be necessary to take over any plants."

The Navy Department on April 4 announced that "under the authority of the last naval appropriation act a manufacturer has been directed to furnish a large order of war supplies at a price fixed by the Government lower than the figure voluntarily submitted and if the order is not obeyed the plant will be taken over and operated by the Government." The Department officials refuse to give the name of the manufacturer or the bureau through which the order was placed, but it is believed the statement does not refer to the torpedo transaction. The section of the law referred to is as follows:

> The President is authorized to require the owner or occupier of any factory in which the ships or war material are built or produced to place at the disposal of the United States the whole or any part of the output of such factory, and, within the limit of the amounts appropriated therefor, to deliver such output or parts thereof in such quantities and at such times as may be specified in the order at such reasonable price as shall be determined by the President.

In addition to the above provision the national defense act passed by the last Congress makes it a felony, punishable by three years' imprisonment and $50,000 fine, to fail to meet the Government's demands, and authorizes the taking over and operation of all or any part of any plant.

There is much curiosity concerning the terms made by Secretary Daniels with the steel manufacturers, but the Department declines to make public any details, notwithstanding the fact that the figures of the recent arrangement for the purchase of 50,000,000 lb. of copper were readily furnished. It has been reported that 2.90c., Pittsburgh, for plates and 2.50c. for shapes and bars are the prices in some contracts. Both War and Navy Departments appear to have adopted various criteria of profits to be allowed manufacturers of war material. In some cases the officials are insisting upon "the average prices of 1916," while in others it is proposed to allow producers a net profit of 6 per cent, which is likely to be very materially reduced by the inroads of the corporate income and excess profits' taxes which are to be heavily increased for the period of the war.

Contracts for Submarine Chasers

The Navy Department is still in the market for 110-ft. patrol boats or submarine chasers. The original estimate was for 2000 of these craft, but up to the present time considerably less than one-fourth this number have been contracted for. The Navy Department declines to make public the names of the contractors or the amounts of the successful bids. While these boats are being constructed preparations are being rapidly made to take into the service a large fleet of small privately owned motor-craft designed for inshore patrol work.

The Navy Department has perfected plans for the expenditure of the emergency appropriation of $115,000,000 carried by the naval bill for speeding up construction of warships and the allotment of $18,000,000 for the equipment of navy yards with additional building facilities. The bulk of the emergency fund will be used in paying for torpedo boat destroyers ordered by the Department in addition to those authorized by Congress and for the big fleet of submarine chasers required for a coast patrol. Several million dollars will also be expended in the purchase and construction of aircraft.

Orders for Steel Helmets and Gas Masks

The Ordnance Bureau of the War Department, as the result of an exhaustive series of experiments with devices used by the armies in the European conflict and especially in trench warfare, will soon be in position to place orders for a large number of steel helmets, hand and rifle grenades, gas bombs, gas masks, etc. For many months the department has been gathering samples of these articles from all the European armies and has not only tested them to determine their relative superiority, but has caused small quantities of them to be manufactured in the arsenals with a view to securing reliable data concerning processes and cost of production. Assuming that the appropriations requested by the Ordnance Bureau for this purpose are granted by Congress and allotted by the department, a very large number of these devices will be ordered, and while a considerable quantity will be manufactured in the arsenals the bulk will probably be produced by private manufacturers under contract.

Extending Navy Yard Equipment

The program for the equipment of the navy yards with improved construction facilities is very comprehensive. Beginning at Portsmouth, N. H., an installation will be provided for the contemporaneous construction of 10 submarines. The New York yard is to be supplied with additional ways, shops, etc., for the building of capital ships at a cost of $3,000,000 and similar equipment will be provided for the League Island yard at an expense of $6,000,000, and for the yard at Norfolk at a cost of about $5,000,000. The remainder of the $18,000,000 will be allotted between the Charles-

ton, S. C., Mare Island, Cal., and Puget Sound yards for equipment for the construction of destroyers and other auxiliary. In this connection it is understood that a careful survey is being made of all the shipbuilding facilities along the Great Lakes with a view to their cooperation in the work of constructing naval auxiliaries and possibly cargo vessels of moderate size.

Commercial Economy Board

The Council of National Defense has decided to appoint a commission "to mobilize the commercial interests of the country for effective and economic distribution of commodities," to be known as the Commercial Economy Board. It will consist of five members, three of whom, Messrs. A. W. Shaw of Chicago, editor of *System;* Edwin F. Gay, professor of economics at Harvard University; and Wallace D. Simmons of the Simmons Hardware Company, of St. Louis, have already been selected. As announced by the Council, the purpose of the board is "to deal forehandedly with problems of wartime distribution." Special attention will be given to methods which will enable commercial houses to release employees the Government may need without dislocating business. The members of the board will serve without pay and will establish offices here with an adequate staff under the supervision of at least one member of the board, who will spend all his time in Washington.

Industry Taxed on Profits, Also by Low-Priced Contracts

WASHINGTON, April 10, 1917,—Estimates forwarded to Congress by the Secretary of the Treasury for funds to carry on the war with Germany for one year, aggregating $3,502,517,000, will be promptly followed by the preparation of measures to raise this vast sum, of which nearly $3,000,000,000 will be employed in recruiting and equipping an army of at least 1,000,000 men, $300,000,000 for extraordinary expenditures for the naval establishment and the remainder for sundry purposes. One of the first steps will probably be the authorization of a bond issue of about $2,000,000,000 at 3 or 3½ per cent, the bonds to be in small denominations to facilitate their absorption by the people at large. Extraordinary taxation will be resorted to, both for the purpose of supplying the remainder of the sum estimated by Secretary McAdoo and to provide a sinking fund to retire the war bonds, as it is the Administration's purpose, so far as it may be practicable, to meet the cost of the war from current revenues.

Income, Excess Profits and Stamp Taxes

The leaders have already given much consideration to the general character of the revenue legislation that will be needed and have outlined roughly the measure that will be enacted before the adjournment of the special session. This measure, as framed by the Ways and Means Committee, will include a substantial reduction in the exemptions and a large increase in the rates of the individual income tax and in the rate now levied upon corporate incomes; an increase, possibly exceeding 200 per cent, in the tax on the excess profits of corporations and partnerships, a material increase in the internal revenue impost on distilled spirits, beer and tobacco products and possibly the reimposition of certain stamp taxes embraced in schedules A and B of the emergency war revenue act repealed last September. While many novel methods of raising revenue have been suggested, the responsible committees are disposed to adhere, at least as long as possible, to devices that have stood the test and concerning the probable productivity of which at increased rates the Government now has much reliable data.

In order that the burden of the war may be distributed as widely as possible it is proposed to reduce the income exemption for single men to $1,000 and for married men to $1,500, imposing a rate of 2 per cent on all incomes up to $5,000. From $5,000 to $10,000 the tentative rate is 4 per cent and from $10,000 to $20,000, 5 per cent. Beyond the $20,000 limit there is much diversity of opinion among the leaders, but it can be stated authoritatively that there is no basis for the published reports to the effect that the Congressional leaders are seriously contemplating any such socialistic measure as the confiscation taxation of all incomes above $100,000 on a 50 per cent basis. It is equally untrue that any one here seriously proposes a maximum limit of incomes by providing that the Government shall take all beyond a certain sum.

Profits to Carry Much of the Load

The excess profits tax is regarded by the Congressional revenue raisers as the device by which the lion's share of the money to carry on the war will ultimately be secured. The ease with which the productivity of this tax can be increased or diminished by raising or lowering the rate appeals strongly to the Government's actuaries and the comparative smoothness with which a similar law has operated in Great Britain is another argument in its favor. Inasmuch as it will be physically impossible to reach a maximum of war expenditures under the present plans during the fiscal year beginning July 1 next, the leaders do not propose at the present session to adopt a maximum rate, which, if the war lasts for two years or more, may equal 50 per cent of profits in excess of 8 per cent plus a reasonable exemption for very small concerns. There is some talk of fixing the excess profits tax for the coming year at a minimum of 15 or 20 per cent on small concerns and graduating it to a maximum of 50 per cent of the profits of the largest corporations, but there are influential men in both houses who are opposing this plan.

No change in the munitions tax is now in contemplation, nor is there any disposition to repeal or reduce this tax because of the proposed increase in the tax on excess profits. The munitions makers, almost as a unit, protested against this form of double taxation in the last Congress, but were unable to modify the preconceived ideas of the leading members of the Ways and Means and Finance committees. Unfortunately, although this is a new Congress, very little new blood has been added to these two committees, both of which appear to be animated by the desire, tersely expressed by majority leader Kitchin in the last Congress, to place the burden of taxation "north of the Mason and Dixon line."

Manufacturers Taxed Through Low-Priced Contracts

In anticipation of the enactment of new taxing laws, appeals are already being received here from manufacturers in various parts of the country protesting against the expansion of such taxing devices as the levies on excess profits and the gains of munitions makers. In this connection it is pointed out that many manufacturers, and in some cases practically all those engaged in entire industries, have already agreed to sacrifice a large part of the profits to be made from foreign business in order to produce war material for the Government. The fact is also emphasized that both the War and Navy departments are insisting upon obtaining supplies at prices which, in many instances, represent little if any profit and are holding over the heads of the producers the provisions of the national

defense and naval appropriation acts which, in effect, authorize the Government, in the event of its inability to obtain goods on its own terms, to seize any necessary plants for their production. Under these conditions, it is insisted, many manufacturers are already paying what amounts to a very heavy tax to the Government. To require such concerns to pay a munitions tax, an increased income and a heavier excess profits tax, it is declared, would amount to extortion or confiscation. It remains to be seen what effect these appeals will have upon the tentative plans of those now engaged in framing the new revenue bill. W. L. C.

Developments in New England Metal-Working Lines

In view of the important part New England has had in the munitions work of the past two years and in the equipping of plants for the manufacture of munitions, the following expressions to THE IRON AGE from a number of representative firms are of special interest at the present juncture:

Whitcomb-Blaisdell Machine Tool Company, Worcester Mass.—It appears to us that the entry of the United States into war will result in the metal working industries finding their facilities taxed to the utmost to answer the demand for their products. Particularly will this be the case with those concerns which have had a large foreign business which they are desirous of retaining. They will, of course, give preference to those orders which will directly or indirectly be of help in the Government's campaign of preparedness. We are already beginning to receive inquiries and requests for speedy shipments from companies engaged in Government work and are giving them prompt attention. We think the Government will see that the industrial ranks are not seriously invaded by enlistments in the field forces.

New Construction Will Be Affected

B. F. Sturtevant Company, Hyde Park, Mass.—We believe that prices will continue to advance. Our own business is closely allied with new construction and indications are that the high cost of building materials will limit new building. We have had two abnormal years in general factory expansion the country over, but we believe that the peak is past. We expect business to keep about normal for some time to come, although our present standard of normal would have been abnormal four years ago. The shortage of help will continue to be a large factor in the volume of new business in our lines.

Underwood Typewriter Company, Hartford, Conn.—Our entry into the war will cause all business to expand and will undoubtedly have the effect of enlivening and increasing trade very much. We have not been hampered as yet by scarcity of labor. In common with other Hartford manufacturers we have as yet taken no step in regard to paying men who enlist.

Greenfield Tap & Die Company, Greenfield, Mass.—We were at the head of the first list published of concerns which had offered their plants and services to the Government. Since that time, Feb. 5, we have been in close touch with the Government and have given its orders preference over all others. We realize that there will be a great demand for tools, but do not see how we can greatly increase our output under present conditions without curtailing our production for the Allies. We feel that skilled mechanics should be required to stay at their machines and should not be taken for the army or navy.

Compensation to Men Who Enlist

Taylor & Fenn Company, Hartford, Conn.—The demand for metal working machinery will be greatly stimulated. Our problem will be to hold our working forces together so that we can produce machines as fast as they will be required. There are even now symptoms of the great desire of machinists to enlist for active service. There is no hard and fast rule in our local industries in regard to payments to dependents of enlisted men. The manufacturers would see that they did not suffer, but there is a general feeling that the State should provide adequate means for this purpose. If a company was only partly recruited from the manufacturing industries there would be a great disparity if the factory men were paid by their former employers and the others had no such added income. The Connecticut Manufacturers' Association is to meet in Hartford, April 11, for the special purpose of discussing this question and deciding upon some uniform action.

Henry & Wright Mfg. Company, Hartford, Conn.—There will be a greatly increased demand for metals of all kinds. We believe that we will have to supply not only our own increased demands for metal working machinery, but will also have to continue to supply the large European requirements. Due to the lack of overseas shpping facilities we look for a slight depression at first, followed by quite a boom later. While it is not a great factor now, there are indications of a labor shortage later. We are planning to help out on Government requirements in every way in our power.

Bullard Machine Tool Company, Bridgeport, Conn.—The machine tool industry, always a basic industry, will be hard pushed to meet Government requirements. There is now an insistent demand by the Government that speedy shipments be made to concerns engaged in its work and this demand is being met by strenuous efforts to increase production. We are now busy in securing a second shift and will put on a third if the men can be secured. The demands for machines has been tremendously increased since the war talk began. We feel that every machine operator should be required to remain at his work.

Conferring With Council of National Defense

Bridgeport Brass Company, Bridgeport, Conn.—There will be an increased demand for metal products. Every one should meet the situation in a fair and generous spirit, each firm taking its share of the work at fair prices. The preference from now on must be given to Government work. The Bridgeport manufacturers have sent a committee to the chairman of the Council for National Defense to see what they must do to be of the most use in the work of preparation. The question of paying enlisted men or their dependents is now under consideration by the Bridgeport Manufacturers' Association. The manufacturers must act as a unit in this matter or the situation will become serious for those who make some form of payment.

Blanchard Machine Company, Cambridge, Mass.—Our opinion as to the effect of the entry of the United States into the war is perhaps best expressed by the statement that last week we signed contracts for an addition to our plant and for additional equipment that will increase our manufacturing facilities 50 per cent. We look forward to great business activity, higher cost, higher prices and a shortage of labor. Even now in this district it would be difficult to gather a second shift and a third shift would be practically impossible. So far as we know no manufacturer in this vicinity has taken steps to pay salaries in part or whole to men who have enlisted.

Union Twist Drill Company, Athol, Mass.—We have

seen no particular increase in inquiries and do not expect any extraordinary business in the immediate future. A week may change our viewpoint entirely, however. We have lost a considerable group of our most skilled employees as a result of the calling out of the National Guard and are greatly impressed with the necessity of leaving men at their regular employment as long as possible, if our industries are not to be crippled. Our work requires special skill and training and it would take a new man many months to reach the required proficiency.

Bristol Brass Company, Bristol, Conn.—The great demand from Europe which has kept us busy for the past two years is dropping off and this will leave us in a better position to take on work directly or indirectly for the Government. We shall have increased demand from this source and have recently received a great increase in inquiries for our products. The labor situation has been serious for some time and the prospective increased demand will make the labor question even more of a factor.

Baush Machine Tool Company, Springfield, Mass.—The first effect of going to war will be increased cost, which means increased prices. We are flooded with orders now for machinery intended for the munitions plants of the Allies and the probable increase in the demand for machinery for domestic plants and for worm drives for motor trucks will bring about a serious labor situation. We are getting out the largest possible production with the available labor supply by working all possible overtime and do not see where we could get the help to make any material increase in our present output.

Fitchburg Machine Works, Fitchburg, Mass.—It looks like even busier days. We are extremely busy now and running nights as far as possible. There is a marked increase in inquiries, presumably for Government work. The attitude of labor will be a factor in this district. The molders in all the foundries in Fitchburg are out on strike now, demanding that the shops be unionized and the pay increased.

Simonds Mfg. Company, Fitchburg, Mass.—The war will raise the price of all materials. It will be a direct stimulus to business and the demand for metal products will be greatly increased. The manufacturers and citizens of Fitchburg got together before war was declared and formed a committee of safety. This committee by public subscription raised a fund of $75,000 to take care of dependents in order to encourage enlistments. Practically all the doctors and nurses in the city have volunteered their services free to take care of dependents.

Heavy Buying of Munitions from Private Plants with $250,000,000 Army Appropriation

WASHINGTON, April 10, 1917.—The army appropriation bill, which failed of passage at the last session of Congress, was reported to the House and passed by that body on April 5, carrying a round quarter of a billion dollars, including large sums for the purchase, as well as the manufacture by the Government, of small arms, field artillery, ammunition and ordnance stores of every description. The big total of this bill will be materially increased by the Senate Military Committee, but the general principles upon which the House measure is based will be adhered to, especially with reference to the purchase rather than manufacture by the Government of a large proportion of the war material needed and the installation in private plants of special equipment for the production of small arms, etc., according to United States army standards.

The bill as passed by the House carries the sum of $12,000,000 for the manufacture and purchase of ammunition for small arms for reserve supply with the proviso that $4,000,000 of this sum may be expended in buying ammunition from private manufacturers. In addition, the sum of $2,000,000 is provided for ammunition for small arms target practice.

Large Orders to Private Manufacturers

The sum of $6,000,000 is provided for the manufacture or purchase of small arms for the national armories, of which $1,200,000 may be employed in obtaining arms by private contract, while $200,000 "may be used to procure gages, dies, jigs, tools, fixtures and other special aids and appliances, including specifications and detailed drawings necessary for the manufacture by private manufacturers of arms necessary to arm the land forces likely to be required by the United States in time of war." As to educational orders that may be given to manufacturers in whose plants this special equipment is installed, the bill provides that the existing laws prescribing competition in the procurement of supplies by purchase shall not govern as to transactions which do not exceed $50,000 in any one case.

To procure general ordnance stores and supplies the bill carries $10,000,000, of which $5,000,000 is made available for the purchase of such stores, the remainder to be manufactured in the Government arsenals. For the purchase or manufacture of automatic machine rifles, such as are used for the equipment of infantry, the bill carries the sum of $5,500,000, with no restrictions as to the proportion that may be used for the purchase of such rifles. For armored motor cars the bill carries $600,000 without restriction as to its expenditure. For anti-aircraft guns and ammunition the bill provides $450,000, it being understood that a large part of this sum will be used for the testing of various guns and devices affording protection against aircraft.

One of the largest items in the bill is $20,000,000, appropriated for the purpose of manufacturing and procuring field artillery and ammunition for the National Guard. There is no stipulation as to the amount that may be expended for the purchase of these articles, but a proviso has been inserted permitting $200,000 of this sum to be used for the installation of special equipment for the manufacture in private plants of field artillery ammunition. Educational orders not to exceed $50,000 each may be placed with such manufacturers without regard to the law prescribing competition.

Keeping Munition Plants in Commission

While the sums appropriated by this bill for the installation of special equipment in private plants to enable them to co-operate with the Government are smaller than desired by the War Department officials, they are sufficient in connection with the appropriations made in the annual fortifications bill to enable the Ordnance Bureau to make a practical test of its new policy of seeking to retain in commission a considerable number of large munitions manufacturing concerns which, because of the completion of foreign orders, might otherwise be induced to sell or scrap their special equipment. The Senate Military Committee is relied upon not only to increase largely the sums appropriated for this purpose, but to remove the restrictions on educational orders and generally to relieve the War Department of any hampering stipulations of existing law that may interfere with the ex-

ercise of the widest possible discretion in the purchase or manufacture of material.

Training Soldiers in Trades

An interesting feature of the army bill which it is understood will be retained by the Senate Committee carries an appropriation of $75,000 for the employment of civilian instructors in the most important manual trades and for the purchase of carpenter's, machinist's, plumber's, mason's, electrician's and such other tools and equipment as may be required, including machines used in connection with the trades and the construction of such buildings for shops and storage as may be necessary to train soldiers in such manner as "to increase their military efficiency and enable them to return to civil life better equipped for industrial, commercial and general business occupations."

Higher Prices Looked for at Cincinnati

CINCINNATI, OHIO, April 9, 1917.—Some iron and steel interests consider that it is too early to predict definitely what effect the entry of the United States into the war will have on prices, though where opinion is offered it is that values will seek even a higher level. Some expressions from pig iron merchants and producers are as follows:

D. B. Meacham, Rogers, Brown & Co.—With the heavy Government demand for iron and steel products it would appear that prices will make further advances, but it is pure guesswork as to what the limit will be under war conditions.

James A. Green, Matthew Addy & Co.—We are having a heavier demand for iron than at any time in the history of our company, and prices are still advancing rapidly. We have made arrangements to pay the full salary or wages of any man in our employ who enlists, less the remuneration he may receive from the Government, and also to hold his position open for him.

E. P. Hettiger, Hickman, Williams & Co.—The probable effect of our entry into the war will be higher prices. The Government's extra requirements could be taken care of in normal times with but little inconvenience to domestic consumers of pig iron, but the extra demand directly and indirectly because of the war is apt to make the metal scarcer. Anyone in our employ who enlists will be paid full salary, less the amount received from the Government.

Buckner Wallingford, Walter-Wallingford & Co.—We anticipate higher prices, basing this prediction on the scarcity of iron at the present time and the probability of a heavy call for metal for Government contracts of all kinds. We have adopted the rule that we understand many manufacturers have decided on—to pay our employees who enlist their full salaries—and further have promised to retain their positions for them.

James I. Stephenson, president Cincinnati Iron & Steel Company.—We have already had advances on different kinds of finished iron and steel materials, and look for a still further marking up in quotations by the mills, which will, of course, necessitate the jobbers advancing their quotations. Our employees who enlist will be well taken care of.

The machine tool builders of Cincinnati are a unit in supporting the Government in the present crisis. In many cases work has been speeded up on Government contracts without any special requests from headquarters to take this step. Both employers and employees are becoming imbued with the idea that they are "doing their bit" by hurrying forward machines that are intended either directly for the Government or for firms having rush Government contracts. The same patriotic enthusiasm is also evident in other manufacturing plants whose outputs are only remotely connected with Government requirements.

Engineers Active in Cooperation

Cooperation by members of the leading engineering societies in various activities of the Government has been an important factor in the organization work of the past week. Various phases of this cooperation are set forth in what follows:

Munitions Making a Feature of A. S. M. E. Meeting

The making of munitions will be a feature of the meeting of the American Society of Mechanical Engineers, to be held in Cincinnati in the week beginning May 21. A joint session will be held with the National Machine Tool Builders' Association, so that the problems of design and operation of machine tools and the relation of these matters to munitions manufacture will come up for extended consideration. But the more specific questions rotating about the problem of making munitions are included in a program which has apparently aimed at a maximum number of vital subjects for discussion in this connection rather than the presentation of a few formal papers. The topics and scope set down for the meeting are as follows:

Mobilization of Material and Industrial Resources, by A. L. Humphrey, vice-president and general manager Westinghouse Air Brake Company, Wilmerding, Pa.

Importance of Intelligent Inspection in Munitions Manufacture, by E. T. Walsh, chief engineer Agency Canadian Car & Foundry Company, New York.

Gages and Small Tools, Frank O. Wells, president Greenfield Tap & Die Corporation, Greenfield, Mass.

Procuring Special Machines, by H. V. Haight, chief engineer Canadian Ingersoll-Rand Company, Ltd., Sherbrooke, Que.

Practical War-Time Shell Making, by Lucien I. Yeomans, industrial engineer, Chicago.

Designing for Quantity Manufacture, by J. E. Otterson, first vice-president and general manager, Winchester Repeating Arms Company, New Haven.

Underlying Principles of Munitions Manufacture, by Harry L. Coe, vice-president Harphan, Barnes, Stevenson & Co., Inc., Boston.

Papers may also be presented on the following topics: Procuring materials; limits and tolerances; hiring and training the working force; interchangeable production of the art of munition manufacture; inspecting; inspection of ammunition pertaining to the requirements of the ordinance department, and munitions contracts and their financing.

Papers of an indirect application to the special problems of the day include the following:

The Problem of Aeronautical Engine Design, by C. E. Lucke, professor of mechanical engineering, Columbia University, New York.

Machine Shop Organization, by Fred G. Kent, Lodge & Shipley Machine Tool Company, Cincinnati.

The mechanical engineers do not at the moment appear to be planning a census of the membership to get at the qualifications of individuals for different kinds of service to the Government. It could very readily make such a census, but it is felt the investigation might be of no special value. It seems that some months ago plans were made for securing certain in-

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Why Railroads Need Higher Rates

The last issue of the *Railway Age Gazette* presents a strong argument in favor of an advance in railroad freight rates. The railroads in the past year have been reporting the largest earnings in their history, but latterly their expenses have been so rapidly increasing that they are now urgently seeking some method of increasing their revenues to avoid deficits. The managers themselves have only recently begun to realize the magnitude of the increases in expenses and taxes which have suddenly been thrown upon their properties. The following estimates are presented as to the extent to which eight items entering into railroad expenses will be increased for the railroads as a whole annually by advances in wages and prices which already have taken place over the wages and prices which actually entered into their operating expenses in most of the twelve months ended June 30, 1916:

Train service employees' wages (due to Adamson act)	$60,000,000
Other employees' wages	40,000,000
Fuel (increase in price, 50 cents a ton)	100,000,000
Taxes (increase, 15 per cent)	22,000,000
Rail (3,000,000 tons, increase in price per ton $10)	30,00,000
Locomotives (3500 at increase in price of 90 per cent)	72,000,000
Passenger cars (3000 at increase in price of 50 per Cent)	18,000,000
Freight cars (175,000 at increase in price of 50 per cent)	105,000,000
Total increase in these eight items	$447,000,000

Commenting on this table the *Railway Age Gazette* says:

"It is hardly necessary to add that these figures relate to only a small part of the total number of items entering into operating expenses, and that large increases, from 25 to 200 per cent, have occurred in practically every such item. Therefore, even though some of these rough and approximate figures be too large, it is not improbable that on the basis of present wages, prices and taxes, the railroads of the Untied States are incurring expenses and taxes exceeding those of the fiscal year 1916 at the rate of $500,000,000 a year. Whether present high prices will be long maintained nobody can say. The only thing certain about them is that at present the railroads must pay them. They may not be long maintained; but, on the other hand, they may be increased.

"The demand will doubtless be made that no considerable increases in rates be allowed until after full and prolonged hearings. Well, the railroads were not given full and prolonged hearings before Congress voted a $60,000,000 a year increase in the wages of train employees. There have been no suspensions of the increases in the prices they have to pay, pending investigation of their reasonableness. They are the only concerns in the country of which it can be said that they are at present receiving less for what they sell and paying more for what they buy than they ever did before."

Effect of Submarine Warfare on Shipping

The submarine warfare has so far not made much of an impress on the number and tonnage of vessels clearing from New York for foreign ports. In March 396 vessels left against 318 in February, but the totals were 403 and 348 in January and December respectively. The monthly tonnage was 1,081,028 tons in March; 911,748 tons in February; 1,149,534 tons in January and 1,053,678 tons in December. This shows that the average tonnage cleared per day in March, 34,900 tons, was less than 2 per cent under the average of December and January and that the daily tonnage of February was only 8½ per cent below the December-January average. The average size boat for March, February, January and December was 2730, 2890, 2850 and 3030 tons respectively.

The McMyler Interstate Company, Bedford, Ohio, has finished its work on a large contract for projectiles for the British Government, and this has resulted in the laying off of 400 to 500 workmen. The company still has a British order for shell forgings, which will not be completed until about July.

LARGE INGOT MOLD CASE

It Will Be Used in Making Great Guns for the Government

The Bethlehem Steel Company, South Bethlehem, Pa., announces that the largest octagonal corrugated ingot mold ever cast in the United States, and probably in the world, was successfully made in the steel foundry of the company at South Bethlehem March 30. The dimensions of the mold are 15 ft. 7 in. in height, having a mean diameter of 91⅛ in. At the thinnest section, or point of the corrugation, the thickness of metal is 15 in., while the heaviest section is 20¾ in.

Owing to the necessity of pouring this casting very quickly, it was decided to make it in the steel foundry, rather than in the iron foundry. Standard Bessemer iron, melted in three large open-hearth furnaces, was suspended in ladles over the mold at one time. A continuous runner from these ladles was made, so that the iron was thoroughly mixed before entering the mold. Three hundred and forty thousand pounds of metal was charged into the furnaces, and after the mold had been filled, 10,000 lb. more iron was brought from the iron foundry, which is situated three-fourths of a mile away, to pour into the sinkhead to feed up the shrinkage of metal. This added metal was filled in about a ton at a time for 3 hr., when the shrinkage stopped; the metal, however, being liquid 5 hr. after the mold was poured.

The making of this large ingot mold, which took four weeks' time, was necessary that a steel ingot of 300,000 lb. could be made for the tubes and jackets for 16-in. and 18-in. guns. Before the mold can be used, large steel bands, 12 in. wide and 8 in. thick, must be shrunk around each end of the casting.

The mold will be left covered in the sand for some time, after which the sand and brick will be removed from it, and two large 100-ton cranes will be used to lift it from the pit to prepare it for shipment to the open-hearth department, where it will be used.

War and Navy Ordnance Bids

The following bids were received by the chief of the Bureau of Ordnance, Navy Department, Washington, D. C., April 4, for furnishing 8100 16-in. and 2000 14-in. armor-piercing projectiles:

Bethlehem Steel Company, South Bethlehem, Pa., for 6500 16-in. projectiles, $750 each.

Midvale Steel Company, Philadelphia, for 2000 14-in. projectiles, $500 each.

Crucible Steel Company of America, Pittsburgh, for 2300 16-in. projectiles, $745 each.

Washington Steel & Ordnance Company, Washington, D. C., for 6500 16-in. projectiles, $750 each; for 500 14-in., $525 each.

Hadfields, Ltd., Sheffield, England, 8100 16-in. projectiles, $513 each.

Proposals until April 14 are called for by the chief of ordnance, War Department, Washington, D. C., for furnishing 5400 6-in. gun shells, 108 lb., cast iron, model 1911; 900 8-in. cast gun shells, 323 lb.; 2800 10-in. cast gun shells, 617 lb., model 1911; 12-in. cast gun shells, 1070 lb., model 1911; 300 14-in. cast gun shells, 1660 lb., model 1909; 2400 12-in. mortar shells, cast iron, 700 lb., model 1912; 2100 12-in. mortar shells, cast iron, 1046 lb., model 1907, and 200 16-in. cast iron mortar shells, 1660 lb., model 1917. For further information address the Chief of Ordnance. This material was originally advertised to be opened April 2.

The Bethlehem Steel Company was the only bidder on four 16-in. guns for the army. Its bid was $215,000 each.

The Manufacturers' Association, Seattle, Wash., has moved to the new Exhibition Building at Fourth and University streets, in that city. The structure will be a permanent industrial exposition building, and has sufficient floor space to accommodate a great number of exhibitors.

SCREW THREAD MEASUREMENT*

Some of the Accurate Methods Used in Gage Making

AT the beginning of the war, when British manufacturers were compelled to make parts in large quantities which should be interchangeable, several facts became evident, particularly in relation to screw threads. The following were some of the principal needs: 1. An exact definition of standards and manufacturing limits to meet the new and abnormal conditions. 2. A more widely diffused knowledge of the principles of gaging and gaging limits. 3. Experience in the method of producing accurate gages. 4. Knowledge of the methods of accurately measuring and checking gages. The definitions adopted throughout this article are illustrated in Fig. 1.

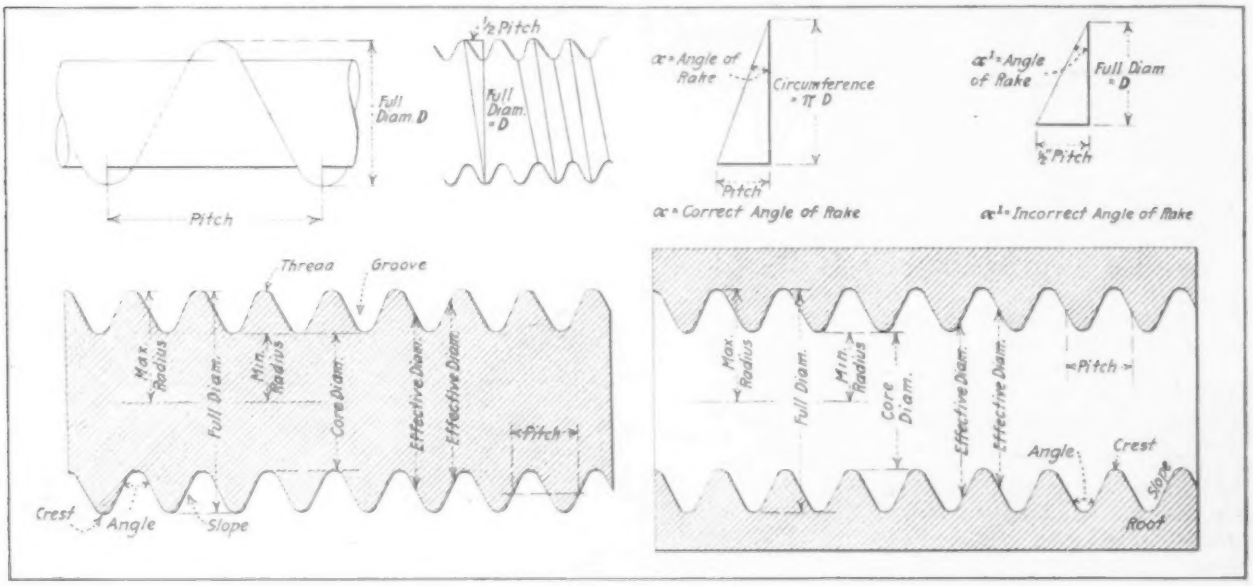


Fig. 1—Sketches showing definitions adopted for various portions of screw threads

While no one instrument has been devised for measuring all the elements of a screw thread in the best possible way, the microscope micrometer has proved to be the most useful for all around service. The instrument consists of a microscope which can be rotated about its axis, a degree of rotation being measured by a circular scale divided into half degrees and provided with a vernier. A single thread of spider's web is stretched across the eye piece and can be rotated with the microscope. The screw under observation is mounted on centers and can be moved in two directions, first along the axis of the screw and second in a direction at right angles to the first, both movements taking place in a plane normal to the axis of the microscope. The movements are controlled and measured by means of micrometer screws reading to 0.0001 in.

The screw is illuminated by a beam of approximately parallel light rays shining over the crests of the threads, from the side of the screw remote from the microscope, and up the microscope tube. The direction of these rays must be in the rake plane of the thread. The accompanying illustrations show the method of using the microscope to measure the various parts of the screw. Fig. 2 illustrates the method of measuring the angle of the screw. The tube is rotated until the web coincides with the edge of the profile of the screw and the angle of the web is read from the circular scale. It is then rotated as shown until the web coincides with the edge of the adjoining thread. The difference between the reading in the first and second positions of the web gives the angle between the threads. Fig. 3 shows the method of measuring the pitch. The web is brought in coincidence with the edge of the screw as for measuring the angle and the screw is then moved in an axial direction by means of the micrometer until the web coincides with the corresponding edge of the next thread. The difference between the micrometer readings gives the pitch. Similarly, the effective diameter is measured as shown in Fig. 4. The web is brought in coincidence with a thread as before, and the screw is then moved transversely across the field of the microscope until the lower edge of the same thread corresponds with the web. Lateral movement is given the screw as necessary by means of the other micrometer. The difference in the readings of the first micrometer gives the effective diameter. It is quite evident that the other elements of the screw can be measured by similar means.

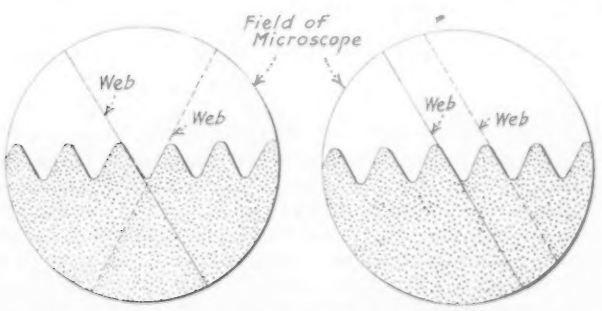


Fig. 2—Method of measuring thread angle by microscope micrometer

Fig. 3—Method of measuring pitch by microscope micrometer

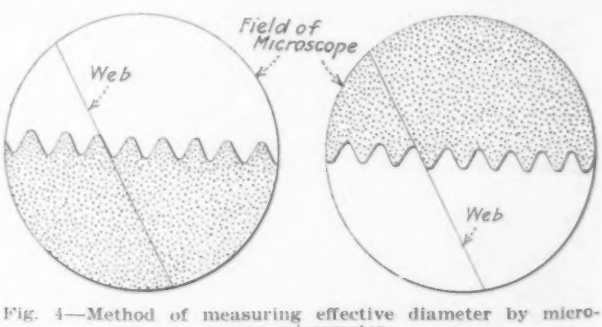


Fig. 4—Method of measuring effective diameter by microscope micrometer

*From a paper read before the Liverpool Engineering Society.

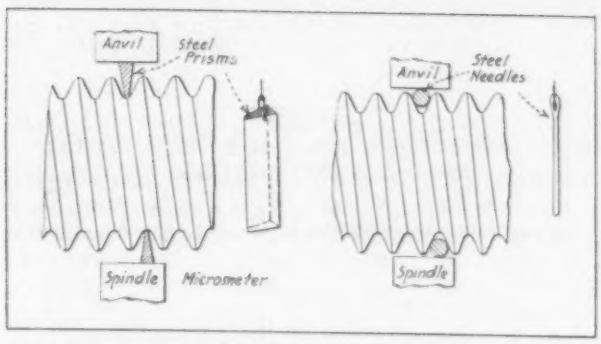


Fig. 5—Method of measuring the core diameter and effective diameter by means of a floating micrometer

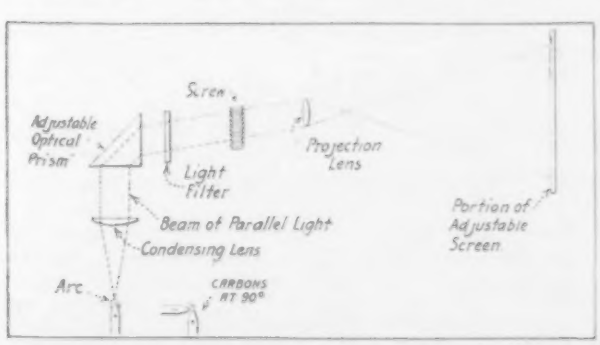
The apparatus, as is the case with all optical instruments, is not entirely free from the personal error in observing. On the other hand, those measurements which involve similar settings of the web to produce consecutive readings are largely free from this personal error, since, being repeated, it disappears in the subtraction for the result. A careful observer with a little practice can get results true to 0.0001 in. or ¼ deg. of angle or less.

Another method of checking core and effective diameters is by the employment of a micrometer floating on balls. The screw to be measured should be of good thread profile with an approximately correct angle. The micrometer is free to traverse the entire length of the screw, but also maintains its position at right angles to the axis. To measure core diameter, two pieces of hardened steel in the form of triangular prisms are employed as in Fig. 5. The cross-section of the prisms is an isosceles triangle with the apex slightly rounded and the apex angle about 10 deg. less than that of the thread to be measured. The prisms are suspended in the angle of the thread, as shown, and the measurement gives the diameter of the core plus the altitude of the prisms. This altitude is determined by separate micrometer measurements, and the difference between the two gives the core diameter. The method of determining effective diameter is also shown in Fig. 5, where cylinders, lapped circular and parallel throughout their length, are substituted for the prisms. Two of these needles of the same diameter are required for each different pitch of thread. The diameter should be such that the needles touch the slope (considered in an axial plane) of a theoretical correct thread in the middle. The micrometer reading gives the diameter over the outside of the two needles from which the effective diameter can be determined by the National Physical Laboratory formula

$$E = T + 0.96049P - 3.16568C - 0.086P^2C \div E^2$$

where E is the effective diameter, T the micrometer reading less the sum of both needle diameters, C the mean diameter of needles and P the pitch.

Fig. 6 represents the principle of the projection apparatus whereby a largely magnified shadow of the thread profile is thrown on a paper screen at a known magnification. The best results are given by working with a magnification of about 50 at the screen. An outline of one or two threads of the form and pitch of the screw under examination is exactly drawn in a fine black line on the screen at the required degree of magnification and the image is projected to coincide with this line. The projection apparatus has a large application in precision work other than screw threads. Gear teeth can be examined and the outline of contour gages, cams, etc., compared with the perfect shape. Fig. 7 shows a comparison of the projected image and the true thread outline of a Whitworth thread as given by an optical projection apparatus.



F 6.—Principle of the optical projection apparatus

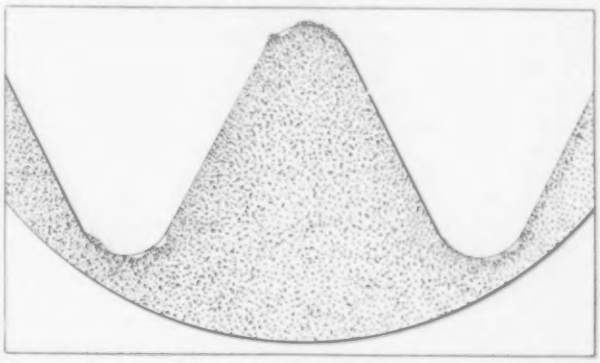


Fig. 7—Comparison of the projected image and true screw thread outline

The War and the Pig-Iron Trade

In their review of the pig-iron market, Matthew Addy & Co. ask some of the questions that have been forced upon makers and users by the entrance of the United States into the war:

"Will the war last long? Will it tremendously increase our industrial needs? Will it turn iron from a mere prince into an emperor? Or will the war bring burdens of taxation that will break us? Will it take from their usual employment so many men for military service that manufacturing plants will be crippled? Will the Government, as has been done abroad, arbitrarily fix maximum prices? Who can tell? Certain it is that no war, big or little, ever left the world as it found it, and the future of the iron trade as well as the future of America are in the unopened book of fate.

"Iron masters are having their troubles. One Southern furnace last month requisitioned 1024 cars and received 152. And replacement costs enormously; for example, a small mine locomotive which cost $12,000 in September is now quoted at $21,000. All costs in iron making have increased; in the case of coke, about 300 per cent. So, while the prices of iron seem relatively outrageously high, as a matter of fact they are only a little ahead of the advance in prices generally."

Industrial Accidents in Pennsylvania in 1916

Eight deaths every day, exclusive of Sunday and holidays, was the approximate average toll of industrial accidents in the State of Pennsylvania in 1916. According to reports made to the Bureau of Statistics and Information of the Pennsylvania Department of Labor and Industry, the total number of killed and injured workmen was 251,488 of which 2587 died from their injuries. The records for the year show that on an average approximately 215 industrial workers were killed every month as a result of industrial accidents in the State and almost 21,000 others were injured. The greatest number of fatal accidents occurred ni the month of October when 287 workers were killed, and the total number of workers killed and injured was largest in March, the figure for that month being 26,971.

MILD STEEL FOR FIREBOXES

Attempts to Substitute It for Copper in England —Success in United States

BECAUSE of the government war restrictions in the use of copper in Great Britain, the question of using mild steel plates instead of copper for locomotive fireboxes is attracting considerable attention. Copper fireboxes are practically unknown in the United States, but in England the mild steel ones have been decidedly frowned upon up to this time. They were tried there on several railroads, but were failures in most cases, largely because they were made of the same thickness as the copper plates.

According to an article in the London *Iron and Coal Trades Review*, there were in the eighties some engines working on the Great Eastern Railway with thin tube plates which had a fairly long life. On several other English railroads, however, the tube plates were made ¾ in. and even 1 in. thick, like those of copper. On the Continent mild-steel inside boxes are also the exception, though they are used on some of the Austrian and on the Wurtemberg State railroads. On the Swedish State railroads the first mild-steel box was put into service in 1908 and was still working in the early part of 1915. On the Gefle-Dala Railway there were six in use, and on the Norwegian State railroads in the Trondhjem district 17 engines built by the Baldwin Locomotive Works were fitted with them, most of which have been in commission for 11 to 18 years. In other districts, however, the experience with them was less favorable.

Nickel-Steel Fireboxes

Owing to the scarcity of copper the Swedish railroads have in some recent orders specified nickel-steel boxes with as low carbon content as possible. The Avesta shops have undertaken to supply material to the following specifications: Ultimate tensile strength, 48.35 tons per sq. in., with 33.5 per cent elongation in 8 in., and 44.3 per cent reduction of area; Brinell test with a 10-mm. ball and a 3000-kg. load to give hardness number 269.

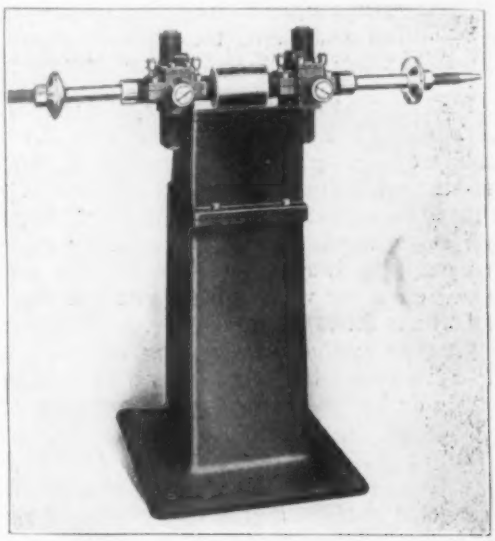
Strips of this steel heated to white heat and quenched in cold water stood being bent over and beaten down flat without any signs of cracks, although the rough edges produced by the shearing were not removed. Some fire boxes were to be tried also of open-hearth mild steel, with phosphorus not to exceed 0.05 per cent. The specified tensile test was 21.6 to 24.8 tons, with a minimum elongation of 26.2 to 23 per cent in 8 in., according to the tensile strength. Sheared strips with rounded arrises, heated to incipient red heat and quenched in water of about 80 deg. Fahr., had to stand being doubled over and beaten down flat without large cracks. Three of the inside boxes were to be with plates welded(not riveted. The staybolts were to be of open-hearth steel, with phosphorus not exceeding 0.05 per cent, and a tensile strength of 20.3 to 24.1 tons per sq. in., with a minimum elongation of 28 per cent in 8 in. The bars had to stand being doubled over and flattened down cold without any cracks. Owing to the war price of nickel, the cost of the nickel-steel boxes worked out the same as that of copper boxes; the welded steel boxes cost about one-half, and in their turn were eight times the price of the riveted steel boxes.

Mild Steel a Success in the United States

The explanation why mild-steel fireboxes answer in the United States but have failed in England evidently is that the Americans use thinner sheets—½ in. to ⅝ in. thick, sometimes even when the front tube plate is made ¾ in. thick—than those which were tried in England. Steel is tougher than copper, but does not stand sudden changes of temperature as well; on the other hand the tensile strength of steel is not reduced but, if anything, enhanced by an increase in the temperature up to 300 deg. C. (572 deg. Fahr.), while copper loses about one-third of its tensile strength when that temperature is reached. Its tensile strength is generally specified to be not less than 14 tons per sq. in. at test house temperature.

Special Polishing and Buffing Lathe

The Noble & Westbrook Mfg. Company, Hartford, Conn., has brought out a buffing lathe of the familiar two-spindle construction and cast-iron bearings with provision for taking up wear. It is stated that unbalanced grinding or polishing wheels automatically



Unbalanced Grinding or Polishing Wheels Will, It Is Said, Automatically Find and Revolve on Their Center of Gravity in This Polishing and Buffing Lathe, Thus Eliminating All Preliminary Work

find and revolve on their center of gravity and run as a balanced wheel. The point emphasized is that the time consumed in having workmen balance wheels for use where a smooth and accurate finish is required is saved.

Deterioration of Rock Drill Steel

The question whether rock drill steel deteriorates in service or not was discussed in a recent issue of the Canadian *Mining Journal*. The statement is made that a company using 1¼-in. round hollow drills had the following breakage record:

Out of 77,305 drills sharpened in the period Feb. 1 to May 1, 1915, 3570, or 4.62 per cent, were broken. The same steel resharpened during the period May 10 to Aug. 9, 1915, showed: Out of 85,882 drills sharpened, 2883, or 3.35 per cent, were broken. In the period March 1 to May 29, 1916, out of 54,285 drills sharpened, 1447, or 2.67 per cent, were broken. The same company showed similar results from 1-in. hexagonal hollow steel. Out of 116,750 drills sharpened in the period March 1 to Sept. 4, 1916, 208, or 0.18 per cent, were broken, while out of 132,750 drills sharpened in the period Sept. 4 to Dec. 26, 1916, 86, or 0.06 per cent, were broken.

The National Steel Products Company, Mansfield, Ohio, has been incorporated with a capital stock of $25,000. It will act as selling agent for C. E. Martin & Brother, Mansfield, manufacturers of portable steel garages, steel culverts and other steel products, including bins and corn cribs. Carl Oberlin is president, and Charles A. Longsdorf, secretary.

The Canadian Collieries, Cumberland, B. C., has taken preliminary steps toward the construction of 50 by-product coke ovens at Union Bay, utilizing the gases and distillates in the manufacture of ammonia and basics for dyes.

American Steel Slags and Their Uses

Their Manganese Value Accented by the War — Large Quantities of Recoverable Elements Wasted —Electrical Reduction in Europe and This Country

BY EDWIN F. CONE

BECAUSE of some interesting uses to which the necessities of war in the steel industry of Europe have caused certain steel slags to be put, the writer was prompted, some time ago, to make an investigation of American slags. Lack of manganese in Europe has been the cause of the new procedure there. Are American slags produced of such composition and in such amount as to warrant similar uses, and are there such uses in this country? It is also interesting to know what disposition is made of these slags here.

Co-operation on the part of a large number of the blast-furnace and steel companies of the United States in answering questions sent out by THE IRON AGE has made possible the gathering together of much interesting data regarding a subject on which collected information is meager. In most cases the composition and uses to which each company puts its slags have been given. In some instances the amount of slag produced was reported.

The Various Slags and Their Disposition

SIX important slags regularly turned out by American steel companies have been considered in this analysis. They all differ decidedly in properties, and are as follows:

Slags from basic open-hearth furnaces.
Slags from acid open-hearth furnaces.
Slags from acid Bessemer converters.
Slags from converters making manganese steel.
Slags from blast furnaces making manganese alloys.
Slags from blast furnaces making pig iron.

Analyses of the various kinds, as furnished by different steel companies, appear in the tables, the manganese content being placed in the first column in each case. This has been done because of the fact that the manganese in slags is being recovered in some cases, and because its availabilty as a future source of manganese alloys is a point in the discussion.

Basic Open-Hearth Slags

Slags from basic open-hearth steel furnaces are probably produced in larger quantities than any of the slags considered. They consist essentially of silicates and phosphates of lime, magnesia and iron. As Table 1 shows, they vary in unessential details. The content of manganese, however is large in some cases, ranging anywhere from 2.50 to 11.50 per cent MnO. The reason for this large variation is due in great part to the kind of pig iron used. If an iron is charged fairly high in manganese, the resulting slag will be higher than when a low manganese iron is used. The use of a manganese iron in basic steel making is becoming more general each year. The manner of introducing the final manganese content into the steel—whether through the furnace or into the ladle—also affects the slag.

Practically in no case did any purely steel-making company indicate a profitable disposition of this basic slag. In some instances some is sold at a nominal figure for roadmaking, but in most cases it is reported as sent to the dump. Two large companies having blast furnaces dispose of much of this slag in their blast-furnace burdens, as will be indicated later on.

Acid Open-Hearth and Bessemer Slags

Except possibly slags from blast furnaces making pig iron, that made by Bessemer converters and acid open-hearth furnaces comes next in volume to the basic slags. Their composition, of course, is radically different from the basic or blast-furnace product, being principally a silicate of iron with varying proportions of manganese compounds. From a manganese percentage viewpoint, these grades of slag are of much more value than the basic. The reported analyses in Tables 2 and 3 show a variation of from 3 to 22 per cent MnO, depending on the furnace practice of the steel-making company.

The wide variation in the percentage of manganese as compared with the basic is not entirely understood. In the case of the acid open-hearth slags it is probable that while less pig iron is used in the original charges, 25 per cent against 50 per cent., approximately, there is correspondingly more steel scrap used, some of which is high in manganese. As the manganese content of the pig iron and scrap varies widely at different plants, so will the content of manganese in the slags vary. Also

Table 1.—Analyses of American Basic Open-Hearth Slags

Steel Company	MnO, per Cent	CaO, per Cent	SiO_2, per Cent	Iron Oxide, per Cent	MgO, per Cent	P_2O_5, per Cent	Al_2O_3 per Cent
No. 1	7.00	45.00	20.00	15.00	5.00	5.00	3.00
No. 2	10.00	42.00	12.00	17.00	5.00	10.00	....
No. 3	8.00	36.00	16.00	20.00	....	1.80	4.00
No. 4	8.00	36.00	16.00	20.00	....	1.80	4.00
No. 5	4.00	....	....	....	....	....	....
No. 6	2.63	45.20	18.50	11.00	16.40	1.65	0.60
No. 7	7.88	49.07	14.20	20.48	3.80	4.20	0.84
No. 8	4.84	46.85	12.90	17.96	7.64	6.84	1.20
No. 9	2.58	49.38	21.98	7.92	7.80	3.94	4.43
No. 10	6.34	47.94	20.00	11.00	11.09	1.50	1.75
No. 11	4.00	40.00	26.00	10.00	9.25	1.25	9.50
No. 12	3.68	49.96	14.00	10.00	....	8.68	2.56
No. 13	3 to 6	40 to 52	10 to 16	8 to 16	4 to 5	1.5 to 3.5	2 to 3
No. 14	6.72	40.81	21.33	15.22	4.71	1.73	7.30
No. 15	5.00	43.00	20.00	13.00	10.00	5.00	3.50
No. 16	11.47	44.74	18.60	11.35	8.30	2.43	3.00

Table 2.—Analyses of American Acid Open-Hearth Slags

Steel Company	MnO, per Cent	SiO_2, per Cent	Iron Oxide, per Cent	CaO + MgO, per Cent	Al_2O_3, per Cent
No. 1	8.00	57.00	25.00	6.50	3.50
No. 2	12.50	44.12	40.88	....	....
No. 3	10 to 15	....	....	....	....
No. 4	3.00	....	....	....	....
No. 5	6.30	....	....	....	....
No. 6	4.73	49.10	44.60	....	....
No. 7	5 to 6	....	....	....	....
No. 8	20.95	45.80	32.10	Trace	0.86
No. 9	9.62	51.70	37.78	....	....
No. 10*	13.00	50.60	35.85	....	....
No. 11	9.07	53.56	33.28	4.09	....
No. 12	12.15	45.08	40.19	....	....
No. 13	4.00	....	....	....	....
No. 14	12.00	50.00	20.00	....	....
No. 15	10.00	....	....	....	....

*Contains 0.38 per cent vanadium from making vanadium steel.

Much of the 2,500,000 tons per year of American steel slags can be charged to advantage in blast-furnace burdens, utilizing manganese, lime and iron. One steel maker says: "It costs the open-hearth department about $8 per car to waste open-hearth slag which is saved by using it in the blast furnace."

the extent to which extra manganese or high manganese pig iron is used in the initial charges for its purifying effect is not by any means universal. This is illustrated by steel company No. 8 in Table 2, where the practice is to use not only initial manganese in some form as a purifier, but also to make a steel considerably higher in manganese. This practice accounts for a percentage of 20.95 MnO in this company's acid slag.

In most cases the replies stated that there was no economical use for this acid open-hearth slag, it being used as grade filling or sent to a dumping place. One or two companies, however, report that for some little time they have disposed of some of this acid slag to neighboring blast furnaces, which have used it in their regular charges.

The Bessemer Slags

A very important slag is that which comes from the Bessemer steel-making converters. This process of producing steel is not as extensive in the United States as the open-hearth, but the slag itself, while similar to that from the acid open-hearth furnaces, is usually higher in its manganese content, as Table 3 shows. The reports from American Bessemer steel plants there recorded show a manganese content in most cases above 10 per cent MnO and as high as 22 per cent MnO. These slags are essentially silicates of iron and manganese.

Table 3.—Analyses of Slags from American Acid Bessemer Converters

Steel Company	MnO, per Cent	SiO_2, per Cent	Iron Oxide, per Cent	Al_2O_3, per Cent	CaO, per Cent	MgO, per Cent
No. 1	2 to 5	.....	.....	.....	.....	.....
No. 2	12.00	.....	.....	.....	.....	.....
No. 3	13.40	20.00	33.50	.....	.....	.....
No. 4	22.18	54.18	19.90	3.48	0.08	.....
No. 5	10.36	67.10	.....	2.24	2.50	0.72
No. 6	9.00	.....	.....	.....	.....	.....
No. 7	11.71	58.17	.....	19.52	.....	.....
No. 8	10 to 15	58 to 64	12 to 14	.....	.....	.....
No. 9*	15.15	55.99	11.32	3.17	0.79	2.13

*Contains 2.15 per cent titanium oxide, TiO_2.

The commercial value of these slags is evidently not regarded as high, for in only one case did any steel company report a use for it otherwise than for filling-in or building purposes. This company stated that 12 per cent was used in regular blast-furnace practice as part of the burden.

Table 4.—Analyses of Slags from American Blast Furnaces Making Manganese Alloys

Company	Ferromanganese MnO, per Cent	Spiegeleisen MnO, per Cent
No. 1	5 to 10	.....
No. 2	8 to 12	3 to 5
No. 3	7 to 8	.....
No. 4	6 to 7	2.5 to 4.5
No. 5	.....	7 to 8

Slags from Converters Making Manganese Steels

Another slag of great value so far as its manganese content is concerned, but almost insignificant in its volume, is that which comes from small converters making manganese steels. A representative analysis of this material is as follows:

	Per Cent
Manganese oxide	47.06
Iron oxide	29.43
Silica	22.15
Alumina	0.92
Sulphur	0.077
Phosphorus	0.03

Only one company producing this slag reported any commercial use for it. Since the war started it has been able to sell its accumulated supply to a blast furnace making ferromanganese and spiegeleisen.

Slags from Blast Furnaces Making Manganese Alloys

It might be expected by some that a blast furnace making ferromanganese or spiegeleisen might produce quantities of slag containing considerable manganese, but reports from such furnaces do not so indicate. The reports of such companies are included in Table 4, which shows anywhere from 5 to 12 per cent MnO from ferromanganese furnaces and from 2.5 to 8 per cent from spiegeleisen furnaces.

While in most cases the disposition of these slags was as rubbish, one company stated that it sold it to pig-iron producers for raising the manganese in pig iron by incorporating it in the furnace charge.

Slags from Pig-Iron Blast Furnaces

So far as their manganese content is concerned, slags from blast furnaces producing pig iron are of no value. This is indicated by Table 5, giving representative slag analyses as produced by 27 merchant and steel-making furnace companies. In only two cases does the manganese oxide content approach 1.50 per cent, and only in one case is it high, 5.67 per cent MnO. These slags, of course, are largely silicates of lime, magnesia and alumina.

The uses to which this slag is put are not unfamiliar. Many companies report using it for grading and filling-in purposes and for constructional work. Many sell it, crushed or uncrushed, for incorporation in concrete or in making cement. Numerous railroad companies buy it, or have it given to them, for use as ballast. It is used in some localities for country-road building, where it has given very satisfactory results.

Recovery of Manganese from the Slags

Considering these various slags from their value as a manganese carrier, the following recapitulation is interesting:

Slag	MnO, Per Cent
Basic open-hearth	2.5 to 10.0
Acid open-hearth	3.0 to 21.0
Bessemer converter	5.0 to 22.0
Manganese steel	45.0 to 50.0
Ferromanganese furnace	5.0 to 12.0
Spiegeleisen furnace	2.5 to 5.0

These figures show that, aside from the high manganese slag from converters making manganese steel the quantity of which is limited, the acid open-hearth and Bessemer slags, with the small amount from blast furnaces making ferromanganese, are of the most value as to manganese.

While the tenor of the replies furnished THE IRON AGE has indicated very little use for these slags as a whole, the following facts are of interest.

based on some of the replies and on some study by the author.

Since the war started and manganese ores became scarce, a good market was formed for the high-manganese slag from manganese steel converters. This 45 to 50 per cent manganese-oxide slag has been sold to one or two companies making ferro-manganese. It has been used in their regular burden, and a large part of the manganese has been recovered, as well as some of the iron.

Basic Slags in Blast-Furnace Burdens

Open-hearth and Bessemer slags, particularly basic, are metallurgically available for use in regular blast-furnace burdens, and economically so in many cases. But it is surprising to learn how few pig-iron makers are really availing themselves of this advantage.

Basic slags are now being run through blast furnaces to recover the lime and some of the iron, but particularly the manganese. One of the largest pig-iron and steel producers in the country has in the past year or two raised the manganese content of its basic and other pig iron from 0.90 per cent to 1.50 per cent by the use of basic slags alone. Some of the phosphorus is also given up, and when this becomes too high the charge of slag is discontinued temporarily or for one day.

Of the 27 replies from pig-iron makers sent to THE IRON AGE only 8 stated that it was the custom to incorporate any slag at all in their regular burdens. One company uses about 5 per cent to raise the manganese and phosphorus in the pig iron. Another uses Bessemer slag to recover the manganese, charging about 2.75 per cent of the ore charge. Still another company occasionally uses about 5 per cent of basic slag of the total burden to add manganese to the pig iron, and sometimes Bessemer slag to clean out the furnace. A large Central Western steel company reports that it uses basic open-hearth slag in its furnace burdens to obtain the lime and manganese, and the Bessemer slags to recover the manganese, and that good results are obtained in both cases. An Eastern pig-iron maker is successfully using acid open-hearth slag, from which he reports the satisfactory and economical recovery of manganese in the iron. One-eighth to one-sixteenth of the ore burden is charged as slag.

Metallurgical Considerations

Without question, the presence of manganese in pig iron is a decided advantage and produces a better steel. This is rapidly becoming recognized, and the demand for manganese-bearing pig iron is more general. Its advantages in the steel-casting industry, in particular, are growing in recognition, and some of the large steel foundrymen insist on the use of a manganese-bearing pig iron or ferromanganese in the initial charge.

It is plain from the analysis of the situation that a wider use of basic slags is possible in pig-iron practice. The producers get the lime and manganese in the slag for nothing, and certain benefits in some cases from the recovery of the phosphorus in the slag. Many steel companies having blast furnaces are not using their own open-hearth slags in the furnace burdens, and many blast-furnace companies are not using valuable slags available from nearby steel makers.

The same is true to a more limited extent of the acid and Bessemer slags. The higher silica content is a drawback to their wide use in quantities in blast-furnace burdens. They are, however, being successfully used regularly according to the testimony of several prominent makers.

Sweden and also Germany are reducing acid slags to high manganese alloys as partial substitutes for ferro-manganese. The United States could not depend on this in a national emergency. The manganese in our acid slags is not one-eighth of that required annually in the American steel industry.

Slags, as a whole, are by-products containing valuable ingredients. The basic, in particular, can easily be used, and it is believed that the successful employment of the acid slags can be advantageously worked out. Bearing directly on these questions is the testimony of one large American steel and pig-iron maker, which is so explicit and illuminating that it is here quoted:

> From our open-hearth slag we recover the metallic contents, iron 18 per cent plus phosphorus 1 per cent plus manganese 10.50 per cent. This is equal to an ore value of approximately 25 per cent in iron, figuring that we lose 40 per cent manganese in furnace practice. This, of course, will vary according to temperatures. Besides recovering the iron, we figure a limestone valuation of about 50 per cent. That is, from every 100 lb. of open-hearth slag in use we get a credit in stone of 50 lb., or we might say that we take off 50 lb. of stone for every 100 lb. of open-hearth slag used. *We figure that it costs the open-hearth department about $8 per car to waste the open-hearth slag which is saved by using it in the blast furnace.*
>
> In another furnace we use Bessemer converter slag and recover the metallic contents, iron 8.50 per cent plus manganese 14 per cent, or equivalent to iron ore of 16 per cent. With converter slag we have a silica content of about 58 per cent, which enables us to use a lower silica ore, consequently giving us a richer mix, and at the same time not too dry a burden, which reflects in the coke practice.

Table 5.—Analyses of American Blast-Furnace Slags

Steel Company	MnO, per Cent	SiO_2, per Cent	Al_2O_3, per Cent	Iron Oxide, per Cent	CaO, per Cent	MgO, per Cent	Sulphur, per Cent
No. 1	.....	35.76	12.64	0.36	44.90	5.41	0.92
No. 2	.....	34.96	15.22	.....	38.12	6.43	.....
No. 3	.....	36.19	11.16	0.40	44.71	5.99	1.25
No. 4	1.56	34.40	14.20	.....	44.50	4.49	1.52
No. 5	.....	35.00	15.00	.....	44.00	5.00	.....
No. 6	.....	38.00	16.00	.....	45.00	.....	1.25
No. 7	.....	32.00	16.00	.....	51.00	.....	.....
No. 8	.....	30 to 33	16 to 18	.....	40 to 50	.....	.....
No. 9	0.49	37.05	12.54	0.72	40.16	7.43	1.04
No. 10	.....	43.00	10.00	.....	40.00	5.00	.....
No. 11	.....	42.64	7.56	.....	49.80	.....	.....
No. 12	.....	34.00	12.00	.....	49.00	3.50	.....
No. 13	.....	40.08	15.28	.....	40.91	3.00	1.46
No. 14	.....	30 to 40	12 to 14	.....	40.00	10.00	.....
No. 15	1.40	33.00	13.00	.....	39.00	12.00	1.60
No. 16	0.23	30.59	16.23	0.61	36.74	12.91	2.12
No. 17	0.40	33.00	14.50	.....	30.00	20.00	1.80
No. 18	.....	25.66	23.49	.....	36.27	11.11	.....
No. 19	0.68	30.50	13.30	.....	31.70	21.50	2.80
No. 20	0.68 to 1.61	31 to 37	14 to 20	.....	41 to 43	4.50 to 6	1.33 to 1.74
No. 21	0.20 to 0.40	33 to 35	16.00	.....	42 to 44	4 to 6	1.25 to 1.60
No. 22	.....	34.43	9.92	0.18	40.90	10.95	1.52
No. 23	.....	33.50	15.30	1.50	26 to 36	7 to 16	2.00
No. 24	.....	33.41	14.20	.....	43.33	4.97	.....
No. 25	5.67	35.44	.....	12.68	45.76	.....	0.90
No. 26	.....	31.10 to 31.80	15 to 16	.....	48.33		.....
No. 27	.....	34.19	12.84	.....	.....		.....

Other Special Slags

The use of certain special basic slags as fertilizer material is familiar, but confined to special

conditions and furnace practice where the original phosphorus content of the ores or pig iron is high.

There is another important slag from certain kinds of basic practice, especially when hot metal is used. It is called the Monell slag, and is tapped from the tilting-oven open-hearth furnace in the early stages of the refining. It averages very high in oxide of iron, sometimes up to 50 per cent, and the manganese oxide is also high. This slag is used by some companies in their regular blast-furnace burden. Not only is considerable iron recovered, but the manganese also is again found in the resulting pig iron.

Electric Reduction of Acid Slags

THE exigencies of war have developed some entirely unusual uses for certain slags in Europe. I refer especially to their electric reduction to alloys high in manganese.

In Sweden two different procedures are being carried out, according to information furnished the writer. The first is the use to which slag from their Bessemer converters is put. In Swedish Bessemer practice a pig iron containing as high as 2 per cent manganese is used, the manganese being the chief source of heat, because Swedish pig iron is very low in silicon and phosphorus. As a result, a Bessemer acid slag is obtained very high in manganese, sometimes reaching 50 per cent MnO. Another Swedish slag comes from the blast furnaces making pig iron. In producing an iron as high as 2 per cent in manganese the slags have a very high manganese content also. Some are stated to average 20 per cent in manganese oxide.

Since the war started, and ferromanganese and other manganese alloys for steel-making purposes grew scarcer in Sweden, attempts were made to recover the manganese. The Swedish Bessemer slag is reduced with charcoal in an electric furnace. It is of the same type as that used in the manufacture of ferrochromium, ferrosilicon, etc. They have one top electrode about 20 in. in diameter and a conducting hearth. The charge is shoveled into the open top of the furnace around the electrode. The alloy and slag are tapped off from the bottom. A product is obtained containing about 60 per cent manganese, with the balance made up largely of silicon and iron.

From another source comes the information that the Swedish blast-furnace slags, which carry about 20 per cent manganese oxide, are treated in an arc electric furnace requiring 1700 kw. and producing an alloy containing 60 per cent manganese and 20 per cent silicon. Because of the high silicon content the usual absorption of carbon is stated to be prevented so that it averages less than the usual 80 per cent ferromanganese.

Probable German Practice

Reliable information is to the effect that the Germans are carrying out one or both of the electric reduction methods for slags referred to, and using such alloys as substitutes for ferromanganese. The serious scarcity of regular manganese alloys in Germany is acknowledged, and without doubt some such practice is being carried out.

Germany, and perhaps Sweden, are also using certain slags in blast-furnace burdens. The extensive German practice of using high-grade manganese ores in regular blast-furnace burdens, referred to in an article by the writer in THE IRON AGE, Dec. 28, 1916, entitled "Germany's Supplies of Ferromanganese," has probably been partly supplanted by the charging of certain furnace slags carrying appreciable quantities of manganese, because manganese ores are no longer obtainable.

While these slag conversions in electric furnaces are interesting, they are regarded as more or less transient, and not likely to be continued after the war. Power consumption is necessarily very high, but whereas in Sweden certain companies have their own water power, it is a paying proposition, especially with the price of ferromanganese at war levels.

Slag Output in the United States

The quantity of slag produced in the United States each year and its manganese content and value present some interesting calculations. Taking the steel output for 1913 as a basis, and estimating the basic slag as 10 per cent of the basic steel made, the Bessemer slag as 2.5 per cent of the Bessemer steel produced, and the acid open-hearth slag as 8 per cent of the acid open-hearth steel, with the manganese-oxide content put at the average found from those reported in the respective tables, we have the following computation:

1913	Gross Tons	Slag, Tons	Manganese Oxide, Tons
Basic steel ingots	19,844,465		
Basic steel castings	460,161		
Total basic steel	20,344,626	2,034,462 × 5.5%	= 111,895
Bessemer steel ingots and castings	9,545,706	238,642 × 11.5%	= 27,443
Acid open-hearth ingots	805,250		
Acid open-hearth castings	450,055		
Total acid open-hearth steel	1,255,305	100,424 × 9%	= 9,038
Totals		2,373,528	148,376

This rough theoretical calculation shows a total slag output of 2,373,500 tons in the United States in 1913. which contains approximately 148,376 tons of MnO, or 114,249 tons of manganese. It was much larger in 1916. The basic slag alone shows a manganese content of 86,159 tons of manganese, most of which is recoverable as manganese in the country's pig iron. The acid slags, Bessemer and open-hearth, contain 28,090 tons of manganese.

The actual value of these slags to the steel industry of the United States is difficult to estimate. It is a striking fact that the value of the basic slags is not fully appreciated. Besides the metallurgical value of the manganese, when reincorporated into steel-making pig iron, there is the economical value of the recovered iron and lime, as well as some phosphorus. The importance of these considerations is only recently being appreciated by steel makers and pig-iron producers.

Whether the acid slags possess, or ever will have, any value in this country from transformation electrically into high manganese-silicon alloys as a substitute for ferromanganese or spiegeleisen, similar to some present foreign practice, is problematical. The proposal is an important one, and has been advocated by certain metallurgists when discussing our manganese supplies. It is certain that the basic slags are absolutely unsuited to such conversion because of their large lime content. In any event, the yearly production of acid slags is not large, for in 1913 this output contained 36,481 tons of manganese oxide, or 28,090 tons of manganese. This, figured to manganese ore, and then to ferromanganese, would mean only 20,472 tons of 80 per cent ferromanganese. Our consumption in 1913 of this alloy was over 200,000 tons. In 1916 it was probably close to 300,000 tons. Unless the large accumulations of such slag could be used, this would be an entirely inadequate resource for manganese, were such an emergency forced upon us.

Interesting developments may be expected from the use of these slags in the future in American

practice. Besides the undoubted value of charging basic slags in regular blast-furnace burdens, it is not unlikely that many acid slags will find a similar use, especially when the product is ferromanganese or spiegeleisen. Only in times of national stress, when expense is no consideration, is their electric reduction a probability.

WOULD AMEND DRAWBACK LAW

Present Measure Has Proved Disastrous to Some Industries

WASHINGTON, April 10, 1917.—The official figures showing the drawbacks of duty paid on exported products made in part of imported materials, which have just been compiled for the fiscal year 1916, show an astonishing increase over any previous year in the history of the country. An analysis of the statistics, however, reveals the fact that the gain is due solely to a single item, the exports of which have been greatly stimulated by war conditions and that, omitting this factor from the equation, there has been a steady decline since 1913 in the refunds on exportations until for 1916 a total was reached below that of any fiscal twelvemonth in the past thirty years. This decline is in part due to the export demand which, in many lines, has been so great as to render drawback allowances negligible, but it is also attributable very largely to the practical operation of the drawback law as amended by the Underwood-Simmons act, which became effective Oct. 3, 1913, and which cut off drawback payments upon the exportation of products or by-products which would not be dutiable if imported into the United States. As the result of this modification of the drawback law, a large number of manufacturers were denied drawbacks on certain exported products or by-products made therefrom because the Underwood-Simmons act had transferred them to the free list.

Exporting interests are already giving consideration to the possibility of securing the amendment of the drawback provision of the present law in connection with the revision of the tariff act which, it is believed, will be undertaken soon after the close of the war. The object of this movement will be to repeal the proviso to the original drawback law added by Congress in 1913, whose effect has been to cut off a large class of drawbacks and in certain industries has put large plants entirely out of business.

A superficial inspection of the statistics showing our exports of manufactures and drawbacks paid for the past ten years gives the impression of a very healthy growth in the utilization of the drawback law since the new tariff act was passed. Thus, in spite of the enormous increase in exports of manufactures in 1916 as compared with 1915, amounting to 120 per cent, there was a very substantial gain amounting to no less than 105 per cent in the drawbacks paid. The relation of drawbacks paid on the exportation of goods manufactured in part of foreign materials to the total exports of manufactures of all kinds in the past decade is shown in the following table:

Fiscal Year	Exports of Manufactures	Drawbacks Paid
1907	$740,314,557	$5,445,150
1908	742,575,841	6,637,602
1909	671,416,014	6,604,432
1910	768,309,063	6,182,375
1911	907,519,841	6,402,603
1912	1,020,417,687	4,525,570
1913	1,185,104,309	4,543,536
1914	1,099,132,210	3,165,082
1915	1,166,093,728	7,449,236
1916	2,658,917,330	15,273,685

The figures presented in the above table, however, give an entirely erroneous view of the drawback situation, for the lion's share of the payments in 1915 and 1916 was made to a single corporation upon the exportation of refined sugar made from imported cane sugar, this movement being entirely due to the war in Europe, which forced the practical suspension of the German beet-sugar industry. In 1914, the refunds on sugar amounted to $463,047; in 1915, they rose to $5,209,565 and in 1916 they reached the substantial total of $13,590,757. Deducting the sugar drawbacks from the total payments, it appears that all other drawbacks paid amounted to but $2,702,035 in 1914, $2,239,671 in 1915 and but 1,684,928 in 1916.

The total refunds paid upon the exportation of articles manufactured in whole or in part of raw materials dutiable under the metal schedule in 1915 and 1916 were as follows:

Drawbacks Paid Under Metal Schedule

	Fiscal Year 1915	Fiscal Year 1916
Agricultural implements	$7,918	$97
Aluminum, rods, bars and coils	30,354	32,180
Aluminum plates and sheets	104,187	33,884
Aluminum, all other	586	76
Babbitt metal	1,443	136
Automobiles, commercial	6,627	26,055
Automobiles, passenger	18,072	11,497
Automobiles, parts of	3,903	2,204
Electrical cable and wire	8,280	3,027
Electric motors	6,725	2,565
Electrical appliances	3,724	743
Explosives, cartridges	25,581	11,028
Explosives, projectiles and shells	21,756	111,122
Ferrovanadium	3,362	163
Bars, rods and billets of steel	7,200	1,692
Battleship	.....	14,272
Steel castings	93	3,368
Cutlery	9,184	5,387
Internal combustion engines	4,759	2,311
Traction engines	1,621	2,084
Steam locomotives	13,275	1,173
All other engines	325	1,491
Parts of engines	626	1,083
Sewing machines	1,868	696
Sugar mill machinery	1,386	577
All other machinery	1,923	631
Needles, sewing machine	2,235	182
Steel sheets and plates	60,718	4,475
Tools	.....	16,459
Steel wire	1,858	89
Wire rope	8,292	3,036
All other manufactures of iron and steel	1,297	1,471
Lead pipes and fittings	2,102	108
Lead sheets	2,017	4,404
Lead shot	3,177	80
Lead wire	.....	10,359
All other manufactures of lead	2,235	.....
Metal containers, except tin	21,394	13,273
Tin cans	476,014	22,546
Tin bottle stoppers	7,775	12,061
All other manufactures of tin	9,325	.....
Zinc in pigs	20,418	31,018
	903,635	389,103

It will be noted that the greater part of the heavy decline in drawback payments in 1916 was due to reduced shipments of tin cans made of foreign plate. Extraordinary fluctuations have marked this item from time to time since the passage of the McKinley tariff act in 1890. As soon as the American industry engaged in the manufacture of tin plate became sufficiently well established, an effort was made by domestic producers to induce exporters of canned goods, especially petroleum, to use American plate on the basis of a price representing the delivered cost of foreign plate less the official drawback. The exporters availed themselves of this arrangement and have since utilized it from time to time, but occasionally market conditions have been such that the American plate manufacturers did not feel justified in paying the unofficial rebate. In 1914, for example, the drawbacks paid aggregated only $92,000, but in 1915 there were heavy importations, the refunds amounting to $476,014. In 1916, however, the domestic producers provided nearly all the plate required by the exporters and the refunds declined to $22,546.

The extent to which the drawback law can be utilized to effect small savings which, in the aggregate, amount to considerable sums, is illustrated in a single item of the above table showing refunds amounting to $14,272 on imported materials used in the construction of a battleship for a foreign nation. These refunds included the following items: iron ore $356, pig iron $8,486, scrap steel $1,188, ferrochrome $3,765 and ferrotungsten $15.

A novelty in drawback allowances, which has appeared in the schedules during the past two years, is the refund made on exportations of war materials. The drawbacks paid on cartridges during 1916, amounting to $11,028, included the duty on the following imported raw materials: aluminum wire $1,368, antimony $1,094, lead ore $4,062, pig lead $4,505. A larger item was the drawback on projectiles and shells, amounting to $111,123, which covered the duties paid on the following raw materials: antimony $36,665, coal tar products $1,386, fuses $9,359, fulminates $1,835, lead ore $8,664, pig lead $13,055, metal manufactures $4,812 and type metal $17,341.

W. L. C.

Efficiency of Waste-Heat Boilers

Graphical Method of Determination Enables Results to Be Obtained Quickly Without Requiring Extensive Calculations

BY H. A. REICHENBACH*

WASTE-HEAT boilers are important installations in a number of industries, such as open-hearth furnaces, soaking pits, reheating furnaces in steel plants, copper, zinc and nickel furnaces, coke ovens, cement mills, brick kilns, etc. The expense of installing a boiler is by no means negligible in any plant, and unless the returns in value of steam produced more than offset the initial cost plus the cost of maintenance of the unit, the investment had better be made elsewhere.

After the installation has been made, it is the usual custom either to assume that the boiler is efficient under the operating conditions peculiar to the plant or to make exhaustive tests at long intervals of time entailing considerable time and expense. If found inefficient, the procedure is to make the necessary corrections and trust that the efficiency will continue at a high standard until the next test which usually it refuses to do. The amount of heat that can be taken from waste gases and recovered in the form of steam depends on the efficient operation of the transforming medium—the boiler. The force employed on an efficiency corps are of necessity men having more than the ordinary intelligence, frequently young men who recently have finished their school education and are quite capable of taking necessary field data but very often, unfortunately, unable to interpret the data taken and determine results.

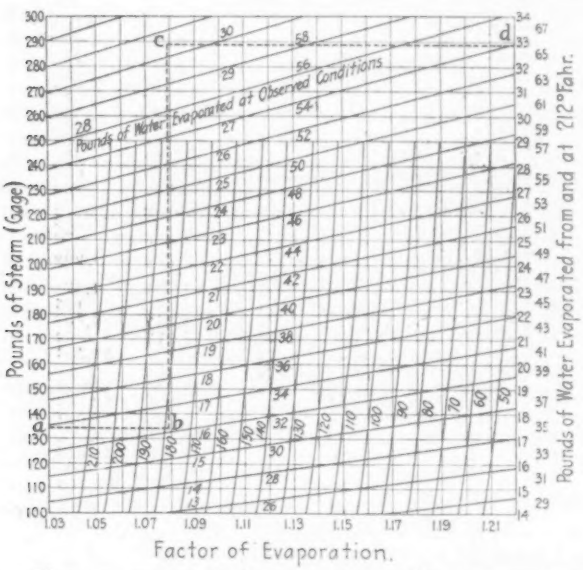

Pounds of Steam (Gage)
Pounds of Water Evaporated at Observed Conditions
Pounds of Water Evaporated from and at 212°Fahr.
Factor of Evaporation.

Chart 1—Locate point *a* corresponding to pounds of steam pressure by gage (134) and draw horizontal line *a-b* to point *b* corresponding to temperature of feed water (179 deg. Fahr.). From *b* draw vertical line to point *c* corresponding to pounds of water evaporated at observed conditions (6100). From *c* draw horizontal line to intersect scale showing equivalent evaporation from and at 212 deg. Fahr. (6580 lb.).

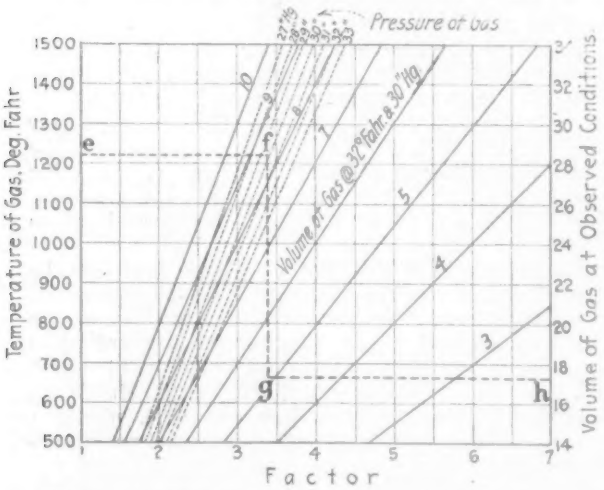


Chart 2—From point *e* corresponding to temperature of gas (1240 deg. Fahr.) draw horizontal line to point *f*, corresponding to absolute pressure of gas (29.9 in.) and from this point draw a vertical line. From point *h* corresponding to volume of gas at observed conditions (1,730,000 cu. ft.) draw horizontal line. The point of intersection *g* of vertical line from *f* and horizontal line from *h* referred to slant lines determines the equivalent volume of gas at 32 deg. Fahr. and 30 in. of mercury (505,000 cu. ft.).

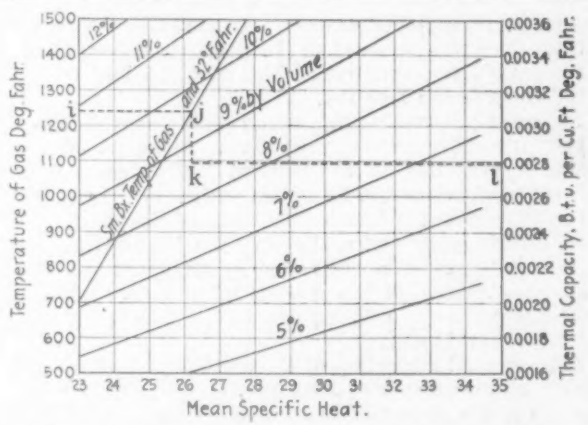

Temperature of Gas Deg Fahr
Sm. Br. Temp. of Gas and 32°Fahr.
9% by Volume
Thermal Capacity, B.t.u. per Cu. Ft. Deg. Fahr.
Mean Specific Heat.

Chart 3—From point *i* corresponding to temperature of gas (1240 deg. Fahr.) draw horizontal line until it intersects line of mean specific heat of gas between temperature of gas and 32 deg. Fahr. at point *j*. Draw vertical line *j-k* to point *k* corresponding to percentage of carbon dioxide in gas (8.7), and from *k* draw horizontal line to intersect scale of thermal capacity, B.t.u. per cubic foot per degree Fahr (0.002785).

The calculation of a test from the data is far from short and simple, involving as it does familiarity with steam tables for the conversion of quantities of water evaporated from observed conditions into equivalent quantities evaporated from and at 212 deg. Fahr., specific heats and thermal capacities of gases for determining the amount of heat delivered by the waste gas, conversion of gases from observed to standard conditions and changing volumes of gases into weights, and the calculator must have at hand tables and reference books to which he will frequently refer for constants and formulæ necessary in the calculations. The accompanying charts have been developed to eliminate most of the time and work necessary in the calculation of a test, and at the same time enable men of average

*Steam engineer Bethlehem Steel Company, South Bethlehem, Pa.

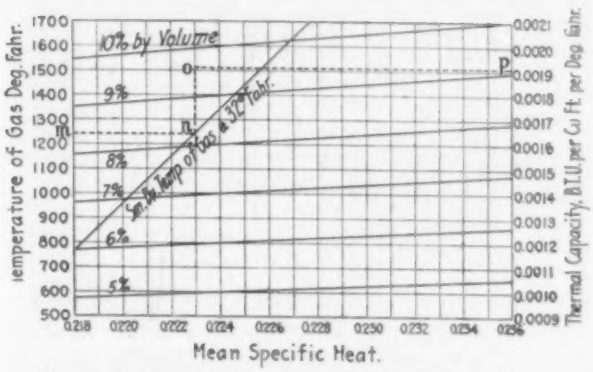


Chart 4—From point *m* corresponding to temperature of gas (1240 deg. Fahr.) draw horizontal line until it intersects line of mean specific heat of gas between temperature of gas and 32 deg. Fahr. at point *n*. Draw vertical line *n-o* to point corresponding to percentage of oxygen in the gas (9.6), and from point *o* draw horizontal line to intersect scale of thermal capacity, B.t.u. per cubic foot per degree Fahr. (0.00191).

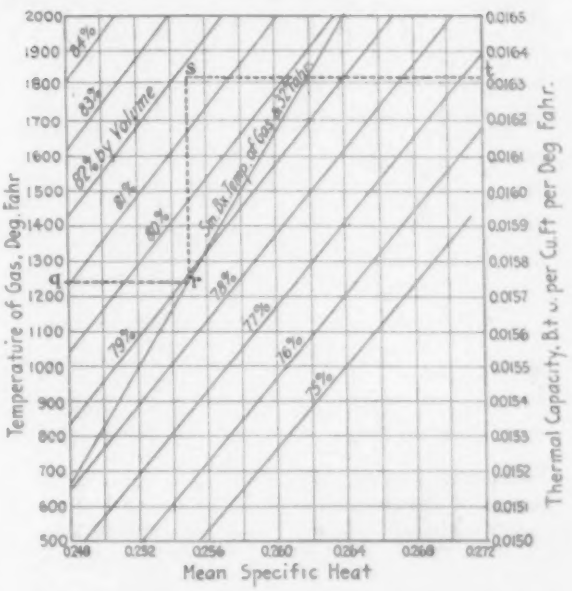


Chart 5—Locate point *q* corresponding to temperature of gas (1240 deg. Fahr.) and draw horizontal line *q-r* to intersect with line of mean specific heat of gas between temperature of gas and 32 deg. Fahr. at point *r*. Draw vertical line *r-s* to point *s* corresponding to percentage of nitrogen and carbon monoxide in the gas (81.7), and from point *s* draw horizontal line to intersect scale of thermal capacity, B.t.u. per cubic foot per degree Fahr. (0.01633).

intelligence to determine efficiency values within a reasonable degree of accuracy.

Chart 1 is a graph for determining the equivalent evaporation from and at 212 deg. Fahr. when the evaporation under certain conditions of steam pressure and temperature of feed water are known.

Chart 2 is used to convert volumes of gas at test conditions of temperature and pressure into volumes

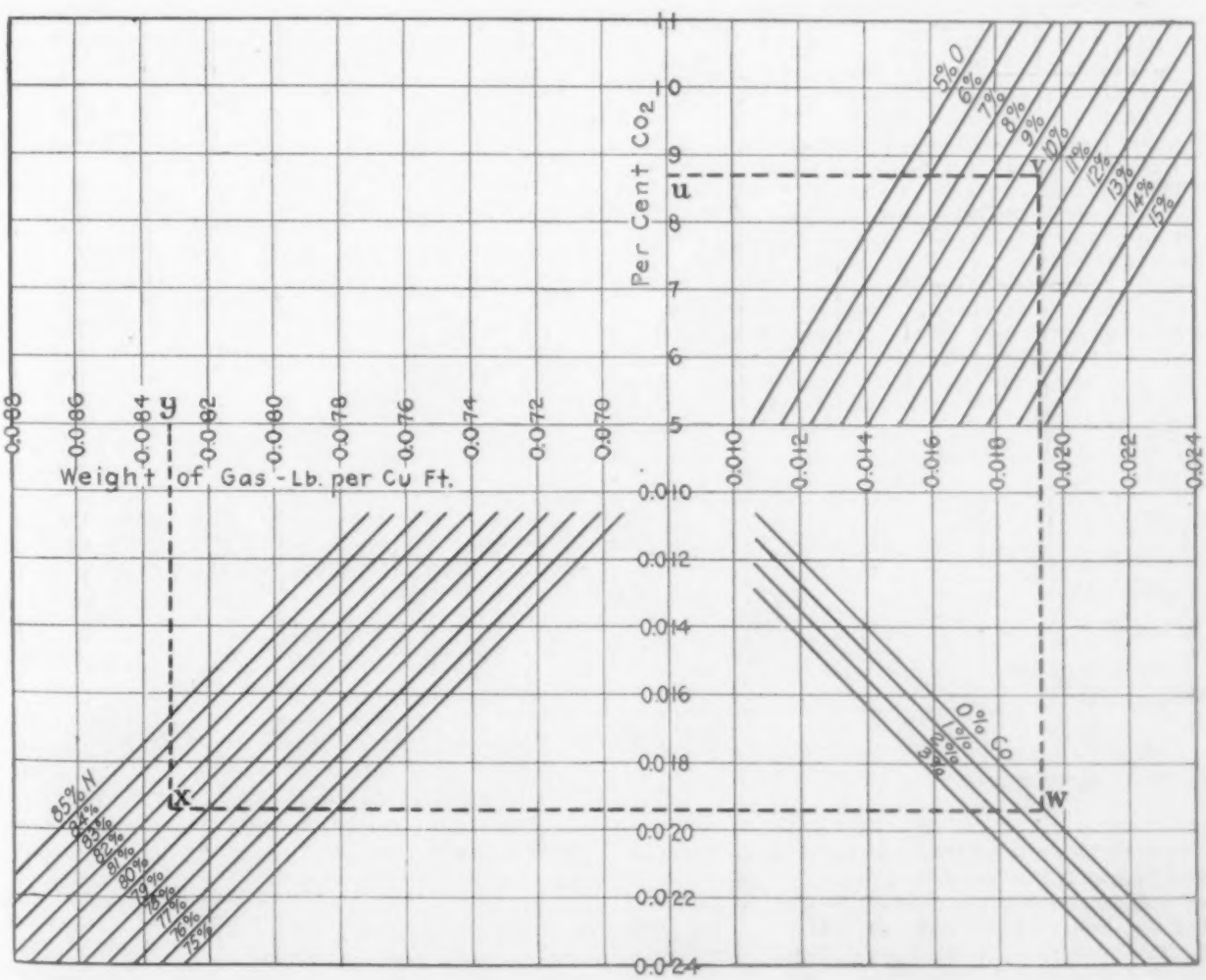


Chart 6—From point *u* corresponding to percentage of carbon dioxide in the gas (8.7) draw horizontal line *u-v* to point *v* corresponding to percentage of oxygen in the gas (9.6), draw vertical line *v-w* to point *w* corresponding to percentage of carbon monoxide in gas (0.2), from *w* draw horizontal line to point *x* corresponding to percentage of nitrogen in gas (81.5), then draw vertical line to intersect scale of weight of gas pounds per cubic foot (0.0832).

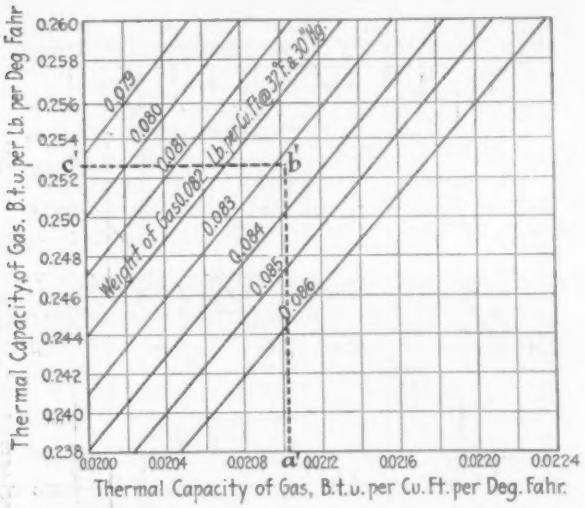


Chart 7—Locate point *a'*, whose value (0.021025) is the sum of the thermal capacity of the carbon monoxide (0.002785) plus oxygen (0.00191) plus nitrogen and carbon monoxide (0.01633) determined from charts 3, 4 and 5 respectively. Draw vertical line *a'*-*b'* to point *b'* corresponding to weight of gas per cubic foot (0.0832), determined from sheet 6, and from *b'* draw horizontal line *b'*-*c'* to intersect scale of thermal capacity of gas, B.t.u. per pound per degree Fahr. (0.2526).

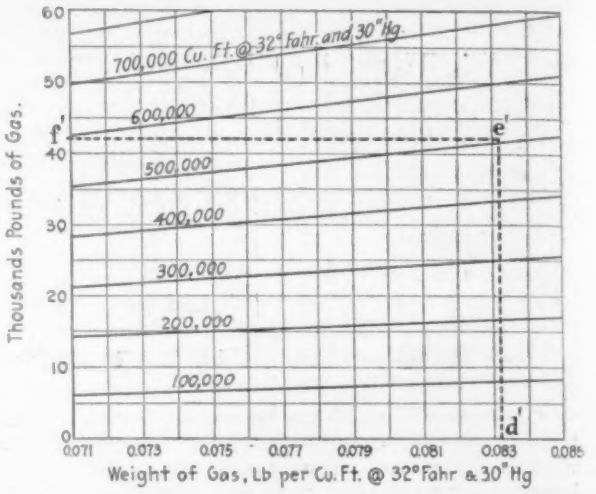


Chart 8—From point *d'* corresponding to weight of gas, pounds per cubic foot, which value (0.0832) is taken from chart 6, draw vertical line to point *e'* corresponding to cubic feet of gas at 32 deg. Fahr and 30 in. of mercury taken from chart 2 (505,000), and from *e'* draw horizontal line to intersect scale of thousand of pounds of gas (42).

of gas at standard conditions, 32 deg. Fahr. and 30 in. of mercury.

Charts 3, 4 and 5 are a series of curves for finding the mean specific heat and thermal capacity of the waste gas. The mean specific heat of the waste gas is the sum of the mean specific heats of the constituents of the gas, carbon dioxide, oxygen, carbon monoxide and nitrogen and the thermal capacity of the waste gas, B.t.u. per cu. ft., is the sum of the B.t.u. delivered by the various constituents in 1 cu. ft. of the gas.

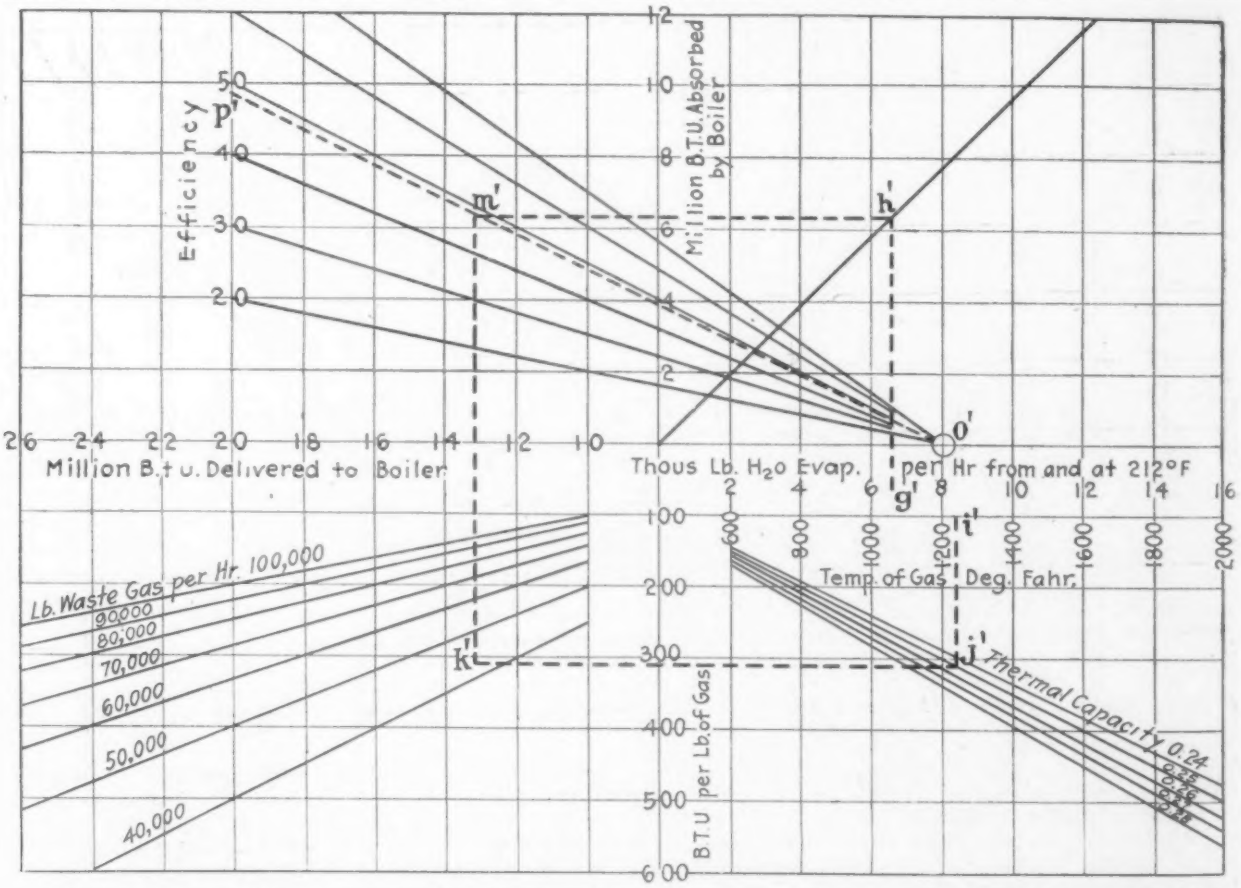


Chart 9—From point *g* corresponding to thousand of pounds of water evaporated per hour from and at 212 deg. Fahr., which value (6.58) is taken from chart 1, draw vertical line to intersect slant line at *h'*. From point *i'* corresponding to temperature of gas (1240) draw vertical line to point *j'* corresponding to thermal capacity of gas, B.t.u. per pound per degree Fahr, this value (0.2526) taken from chart 7, and from point *j'* draw horizontal line *j'*-*k'* to point *k'* corresponding to pounds of waste gas per hour, which value (42) is taken from chart 8. Draw vertical line from *k'* and horizontal line from *h'* and locate point of intersection *m'*. Through zero point of sheet *o'* draw line through *m'* to intersect efficiency scale at some point *p'*. The location of this point measured along the efficiency line will designate the efficiency of the boiler (48.4 per cent). By using this scheme, constant supervision and a close check can be exercised over important producers at small expense for an efficiency corps and in the minimum of time.

Chart 6 is a graph for determining the weight per cubic foot of the waste gas at standard conditions from the percentage composition of the gas.

Chart 7 shows the relation between the b.t.u. per cu. ft. and B.t.u. per lb. of gas at standard conditions.

Chart 8 is a curve for converting volumes of gases directly into weights at 32 deg. Fahr. and 30 in. of mercury.

Chart 9 is the efficiency sheet and gives values of heat absorbed by the boiler and heat delivered to the boiler by the waste gases.

The constants and formulæ used are those given in Prof. Richards's Metallurgical Calculations, which are conceded to be the most accurate.

In using these curves the waste gases are assumed to be dry. If the sensible heat carried into the boiler by the moisture in the waste gases is to be taken account of, this can be calculated from the percentage of hydrogen and water in the coal or gas used as fuel in the furnace plus the amount of moisture in the air used for combustion of the fuel and the necessary corrections made.

The following scheme has been found to work advantageously toward the efficient production of steam where considerable reliance must be placed on the amount of steam produced in the waste-heat boilers in the plant. Data are taken on the boilers at stated short intervals and recorded on boiler test forms together with results obtained from the charts.

A practical example is shown:

Test Data Observed	
Water evaporated, lb. per hr	6,100
Steam pressure (gage), lb	134
Temperature of feed water as fed to boiler, deg. Fahr.	179
Gas to boiler, cu. ft. per hr	1,730,000
Temperature of gas as fed to boiler, deg. Fahr	1,240
Draft at intake of boiler, in	1.03
Barometer, in.	29.9
Composition of gas:	
Carbon dioxide per cent	8.7
Oxygen, per cent	9.6
Carbon monoxide, per cent	0.2
Nitrogen, per cent	81.5
Results	
Factor of evaporation	1.0778
Water evaporated from and at 212 deg. Fahr, lb.	6,580
Factor for conversion of gas at observed conditions to 32 deg. Fahr. and 30 in. of mercury	3.77
Volume of gas to boiler at 32 deg. Fahr. and 30 in. of mercury, cu. ft. per hr	505,000
Mean specific heat of CO_2	0.2623
Thermal capacity of CO_2 in 1 cu. ft. of waste gas, B.t.u. per cu. ft. per deg. Fahr	0.002785
Mean specific heat of O	0.2230
Thermal capacity of O in 1 cu. ft. of waste gas, B.t.u. per cu. ft. per deg. Fahr	0.00191
Mean specific heat of N and CO	0.2550
Thermal capacity of N and CO in 1 cu. ft. of gas, B.t.u. per cu. ft. per deg. Fahr	0.01633
Weight of waste gas per cu. ft. at 32 deg. Fahr. and 30 in. of mercury, lb	0.0832
Thermal capacity of gas, B.t.u. per cu. ft. per deg. Fahr.	0.02102
Thermal capacity of gas, B.t.u. per lb. per deg. Fahr.	0.2526
Weight of gas to boiler per hr., lb	42,000
Heat absorbed by boiler per hr., B.t.u.	6,400,000
B.t.u. per lb. of gas delivered to boiler	312
B.t.u. delivered to boiler per hr	13,200,000
Efficiency of boiler, per cent	48.4

Navy Wages Disturb Local Employers

The Morgan Mfg. Company, manufacturer of automobile, hardware and motor necessities, Newport, R. I., is seeking a new location for its business in order to get away from labor conditions growing out of its proximity to the United States Government torpedo plant. Inducements offered by the Navy Department are too great for such an open competitive business to meet. The Government is paying boys $17 per week and machinists up to $40 per week, and recently has granted a 10 per cent increase, effective July 1, to all employees whose salary is less than $1,200 per year. In addition to these inducements, Government employees are granted a cumulative vacation of 30 days per year with full pay. The Morgan Mfg. Company is therefore compelled to move its business away from such a situation.

Large Cast-Steel Locomotive Cylinders

An interesting achievement in steel foundry products is represented by the accompanying illustration of a very large cast-steel locomotive cylinder, one of the largest ever made of steel. Six of these were supplied to the American Locomotive Company for incorporation in locomotives for the Birmingham & Southern Railway. They are known as 23-in. by 28-in. cylinders and each

One of the Six Large Cast-Steel Locomotive Cylinders Made by the American Steel Foundries for the Birmingham & Southern Railway

one weighs 7300 lb. The principal dimensions of the castings are as follows:

	Inches
Cylinder bore	23.0
Length of cylinder, face to face	39.0
Outside diameter of flange	30.0
Steam chest bore	13.5
Length of steam chest, face to face	42.0
Steam admission pipe	6.5
Steam admission pipe flange	13.5
Length of saddle flange	42.0
Radius of saddle flange	38.5
Height of joint flange	47.5
Length of joint flange	42.0
Length of saddle body	31.0
Horizontal distance of center line of cylinder to center line of steam chest	7.0
Vertical distance of center line of cylinder to center line of steam chest	24.0
Total height over flanges of cylinder and steam chest	48.75

These cylinders were for consolidation type locomotives having a length of 39 ft. over all, a total wheel base of 23 ft. 8 in. and a driving wheel base of 15 ft. The eight driving wheels had a diameter of 53 in. at the tread.

Such castings are considered extremely difficult to make and involve unusual problems in core making. These six cylinders were made by the American Steel Foundries at its Chester, Pa., plant and were very successful. Most locomotive cylinders are of cast iron which has a shrinkage of only half that of steel. It is therefore apparent that the production of these in steel renders the shrinkage and core problems difficult. No special kind of steel was incorporated in them. They were made of ordinary medium carbon cast steel.

The Sharpsville furnace, at Sharpsville, Pa., owned and operated by the Allan S. Davison Company, Oliver Building, Pittsburgh, was blown out Feb. 27 for relining and repairs. New equipment was added, consisting of two downcomers, dust catcher, bosh plates, and vertical cooler, and the furnace was completely relined. It was put in blast again April 1, having been idle only 33 days while all this work was being done. Two shifts of men worked night and day 11½ hours each. When the scarcity of labor and materials is considered, this work was certainly done in record-breaking time.

The adjustable lift truck made by the F. J. Bloodgood Company, Binghamton, N. Y., described in THE IRON AGE of March 29, weighs 400 lb.

NATIONAL LEAD'S OPERATIONS

Will Engage in the Smelting of Tin Ore from Bolivia

The National Lead Company's report for the year ended Dec. 30, 1916, shows that $445,750.99 was added to the surplus after the payment of dividends of 7 per cent on the preferred and 4 per cent on the common stock and the addition of $500,000 to the reserve funds. Its surplus Dec. 30, 1916, was $6,183,112.93, and its financial condition is stated to be stronger than ever before.

The company finished the first quarter century of its existence Dec. 5, 1916. All the subsidiary companies are in a prosperous condition. It has gradually expanded its manufacturing operations until now white lead, red lead and litharge, while still very important, are by no means the all-important factors of its business they once were. The report states that prudence requires that the company should keep itself financially strong until the difficulties and losses, if any, attending the readjustment to normal conditions after the war are more definitely known and therefore the dividend rate on the common stock has not been further increased. The following particulars regarding the diversified interests of the company are taken from the statement submitted to the stockholders by President Edward J. Cornish:

"We purchased during the year one-half of the capital stock of Williams Harvey & Co., Ltd.—the largest tin smelter in Europe—having two plants in England, located at Liverpool and Hayle, Cornwall. The purchase contemplated the erection of a tin smelting plant in the United States, which will be operated in connection with the English company. An American company has been incorporated under the corporate name Williams Harvey Corporation to transact the business in the United States. The National Lead Company expends over $10,000,000 a year in the purchase of tin which it markets in the form of solder, type metals, tin pipe, babbitt metals and other articles. The company has for many years smelted scrap tin and tin drosses. We have also experimented for several years with the smelting of tin ores in the belief that the tin ores of Bolivia, shipped through the Panama Canal, should logically be smelted in the United States for domestic consumption. By the arrangement above outlined we have acquired the best smelting talent in Europe and also an immediate connection with the tin-ore producers on the west coast of South America.

"The National Lead Company examines carefully every new invention that is related to its manufacturing operations or would be marketed through the same channels as its other products. Our extensive acquaintance and the reputation of our products enable us to exploit a new article, having merit, in much less time than could the inventor. A case in point is the acquisition by the company during the year of 51 per cent of the capital stock of the Cinch Expansion Bolt & Engineering Company. The increasing use of concrete has caused a demand for an improved method of attaching equipment to the surface of the masonry. Lead is the best material for fixing in place the anchors necessary for this purpose. The Cinch bolt consists of an iron bolt held in place by lead wedges.

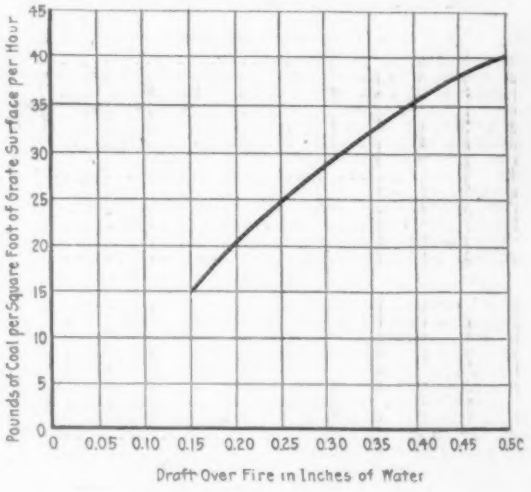
"Our die-casting business, which was begun some years ago to fill a demand for white metal alloys molded into form ready for use, has increased so that the large plant built in Brooklyn in 1915 is already too small to take care of the growing business. Another larger building is now being constructed in Brooklyn in which to manufacture pressure die-castings made of aluminum and its alloys. The Hoyt Metal Company is constructing a large building for the die-casting department at its St. Louis plant, the construction of this building being necessary to take care of its increasing business in the West.

"The National Lead Company owns one-half of the capital stock of the United States Cartridge Company, the owners of the other half being for the most part the active managers of the company who have acquired great technical skill by their long experience in the industry. It has, since our connection with it, commenced the manufacture of loaded shells for shot-guns—the shot being manufactured by the United Lead Company. The sales of shot-gun ammunition are increasing and, with the assistance of the sales departments of our several branches supported by the quality of the shell, should increase much more rapidly in the future. The United States Cartridge Company obtained a number of large contracts for rifle ammunition. It is believed that these will prove profitable."

New York City papers state that a nine-acre plot on Mill Basin, Jamaica Bay, Long Island, has been purchased by the Williams Harvey Corporation, for the purposes mentioned in the foregoing report of the National Lead Company. Plans for a plant are under preparation, and in less than a year it will be ready for tin smelting. Only one unit, with an output of about 300 tons per month, will be erected at present. The National Lead Company will also shortly let a contract for the construction of a building on Mill Basin to be devoted to the manufacture of sheet lead and lead pipe. This new factory will require 7000 tons of pig lead yearly.

Smokeless Combustion of Fuel

Furnace draft was found to be the most important consideration in the smokeless combustion of fuel among steam boiler furnaces, according to an investigation by Osborne Monnett, formerly chief smoke inspector of Chicago. The investigation was described in a paper read by him before the Engineers Society



Draft for Smokeless Combustion

of Western Pennsylvania and published in the December, 1916, issue of the *Proceedings* of that society. The investigation developed a rough rule that 0.1 in. of draft was necessary over the fire per pound of coal burned per square foot of grate surface per hour. The limiting rate for successful smokeless combustion for hand-fired furnaces is about 28 lb. of coal per square foot of grate surface per hour.

In studying the smoke problem in Chicago, it was found that a firebrick arch directly over the fire increased the amount of smoke due to the fact that there was not only the normal distillation of volatile matter but also an artificial distillation due to the high temperature of the heat radiated from the arch over the fire. This secondary distillation results in dense smoke despite all efforts to prevent it. The removal of the arch from directly over the fire diminished the rate of distillation of volatile matter and eliminated the production of smoke.

Interests connected with the Pacific Coast Steel Company, Seattle, Wash., have taken over a 10-acre site near Linnton, Ore., on which it is proposed to erect a steel plant and rolling mills. It is stated the initial plant will manufacture angles, channels, bars, bolts, etc., and will be later equipped to produce steel plates.

War and Steel and Metal-Working Trades

(Continued from page 892)

formation of the different members, for totally different purposes than demanded at the present time, but there is no present intention of putting through this inventory of personal attainments. What such an investigation is planned to provide for the society is a live list from which candidates may be taken and proposed for positions which are open from time to time. Ordinarily an opening is filled only by a member out of employment; but often the engaged member would be glad to make a change, though not even considering the solicitation of a position. The census was also desired to secure a line on the qualifications of different members to provide papers for different meetings on certain subjects—an important fact when it is realized that meetings are now held in twenty different cities in addition to the two conventions each year—and also to secure a list from which selections may be made for inviting discussion of papers. The society's office is also commonly called on for advice of an engineering nature, and it is desirous of making the recommendations of the most expert in the subject of inquiries.

Electrical Engineers' Meeting Canceled

As a result of the state of war, the American Institute of Electrical Engineers has had to cancel its meeting scheduled to be held at Schenectady, N. Y., on April 13. While no reason is given for this decision, it is understood that the General Electric Company has work in hand at Schenectady which makes it undesirable to take care of visiting engineers. The main subject for the meeting had to do with the heating of electrical machinery, temperature guarantees, distribution and the like, and some doubt was also felt apparently that a very large meeting would have resulted.

A Joint Engineers' Committee on National Defense

For members of the engineering societies who contemplate offering their services to the Government, a joint Engineers' Committee on National Defense is about ready to send to the civil, mining, mechanical, electrical and chemical engineers two pamphlets of instructions to those who are considering joining one of the reserve corps in either the army or the navy. What is involved in a general way in enlistment in one of these corps in connection with the army was outlined in THE IRON AGE of April 5, in describing the activities of the Cleveland Engineering Society in this regard; but the army pamphlet now being sent out is more explicit with regard to the subdivision of specialty of each class of service and with regard to the qualifications. To the information already noted in these columns, it may be added that the pay of officers in uniform throughout the army and in time of actual service, like the present, is for majors $3,000 per annum, for captains $2,400, for first lieutenants $2,000, for second lieutenants $1,700; but the officer has to purchase his uniform and personal equipment and pay for his food.

The idea is gaining ground in engineering circles that the Government will not look kindly upon those who offer their services and accept commissions and at the same time expect to keep their hand on their present engineering connection. In short, the Government will expect the engineer to sacrifice himself to the extent that he will divorce himself from his present connections and devote himself wholly to the demands of the Government in the branch with which he identifies himself. The place for the mechanical engineer in the service of the Navy Department has already been discussed at length in an article by Lieut. Frederick G. Coburn, U. S. N., in THE IRON AGE of March 15. The circular of the engineering societies relates particularly to enrollment in the Naval Coast Defense Reserve and covers also service on patrol boats and the Naval Reserve Flying Corps.

Census of Mining Engineers and Chemists

A census is in preparation, or is now being made, in behalf of the Council for National Defense by the Bureau of Mines, Washington, of the members of the American Chemical Society and of the American Institute of Mining Engineers. Besides securing a line on the education, experience and probable qualifications of the individual, the blank of inquiry asks concerning one's specialty or admitted proficiency, his position as regards dependents and also as to his attitude toward enlisting in the branch of the service for which he seems to be specially qualified.

Remission of Engineering Society Dues

The American Society of Heating and Ventilating Engineers is considering the taking of steps to remit dues to all members who enlist in the service of the United States Government. As yet nothing has been heard of similar action by the other engineering societies.

New York Engineers Are Organizing Regiment

Engineers of New York City and vicinity, acting upon authorization from the War Department shortly after President Wilson's declaration of a state of war between the United States and Germany, have set in motion machinery for the organization of an engineer regiment. Col. C. H. McKinstry, Corps of Engineers, U. S. A., will be the commanding officer, while the battalion commanders will be Majors William Barclay Parsons and Arthur S. Dwight, both of the Officers' Reserve Corps. Capt. X. H. Price has been detailed by the War Department to assist Colonel McKinstry and the military engineering committee at office headquarters. Already a call for enrollment in the new organization has been issued, office headquarters established on the seventh floor of the Engineering Societies Building, with Dr. Joseph Struthers as office manager, and cost of recruiting and certain other expenses have been underwritten by members of the military committee of New York through whose initiative the new engineer regiment is rapidly taking form. For active recruiting an office will be opened in a few days and arrangements have already been made for a training camp on Staten Island. Early this week, before enrollment blanks had been sent out in large numbers, 150 men had signified their intention of joining the new organization.

The rank and file of the new regiment is to be composed of skilled mechanics and it is these men that the committee is endeavoring to reach through the members of the larger national engineering societies. As one engineer regiment is authorized for each 20,000 members of the army, the committee plans to continue its work as long as any need exists. The *Engineering News-Record*, from which some of the foregoing facts were obtained, describes, in its forthcoming issue, the plans of the military engineering committee, in part, as follows: It is assumed that "all the officers and 5 to 7

per cent of the men will be drawn from the ranks of professional engineers, but the great bulk of the men must be enrolled from the ranks of men skilled in the various trades." It is pointed out that any method of selective conscription would be impossible to carry out in recruiting engineer troops, because the men desired would probably not come within the age limit of 18 and 23 years. The feeling among its members is that the regiment is to represent the engineering, contracting and manufacturing interests of New York, and as such that it should be a model for the entire country.

Late News Features of the War Campaign

Pay of Pittsburgh Workers Who Enlist

Pittsburgh steel companies have not decided definitely what they will pay their men that enlist for war service. Members of the Pennsylvania National Guard that were on border duty when war was threatened with Mexico were paid by the Carnegie Steel Company and other companies the difference between what they were earning before enlisting and what the Government paid them, so that their earnings were not diminished.

Views on Chicago Market Outlook

G. H. Jones, vice-president Inland Steel Company, Chicago, asked concerning the effect of this country's entrance into the war, said: "The action of this country certainly will not decrease the demand for steel, but will have the opposite effect. It seems like that some of the steel heretofore used for domestic purposes or exported for commercial uses will be diverted to Government needs. I doubt that the Government will cut off any of the steel needed by the Entente Allies, as supplying them with steel is one way in which we can help them. The withdrawal of men from industry is of course a serious matter and probably will curtail operations and reduce output. If any considerable percentage of men is taken it is hardly likely that the loss can be entirely made up, no matter to what extent operations are speeded up. As to the Government's requirements, it does not look as if the tonnage would be large enough to embarrass the mills."

The head of a steel company in the Chicago district expressed the opinion that the increased demand which war will bring, coupled with the labor shortage, will tend to send prices to higher levels unless the Government undertakes to regulate them.

Donald M. Ryerson, Joseph T. Ryerson & Son, Chicago, said: "It seems probable that the increased irregularity in mill deliveries for manufacturing or general domestic consumption on account of war requisitions will create even more active interest in those sources that have any material open for summer delivery. In other words, the tendency would seem to be toward an even more feverish market for spot or visible supply, not only in steel but in almost all materials."

J. H. Williams & Co. to Employees

Employees of J. H. Williams & Co., manufacturers of drop forgings, have received the following notice, which was posted at the Brooklyn and Buffalo, N. Y., plants and at the offices in Chicago: "In the present crisis in our relations with the German Government it is the purpose of this company to treat all of its employees alike, regardless of nationality of birth or descent. The company expects from all in its employ the same loyalty that has been proved so often in the past, and takes it for granted that this loyalty will be extended in even greater measure to the policies of the United States Government. We cannot do otherwise than indorse the suggestion of the President that we all, in our various relations with each other, allow no accident of heredity to influence our feelings at this time toward those who are loyal American citizens."

J. H. Williams & Co. have decided to guarantee for one year the payment of 50 per cent of wages or salaries to men enlisting who have families, and 25 per cent to unmarried men.

War Topics at Export Manufacturers' Luncheon in New York

War conditions came in for considerable attention at the monthly luncheon of the American Manufacturers' Export Association held Thursday, April 5, at the Hotel Biltmore, New York. The chief speaker was Capt. David L. Hough, managing director of the Moscow Central Station Company, Russia, a captain of U. S. Volunteer Engineers of the Spanish-American War and builder of tunnel work for the Pennsylvania Railroad in New York as head of the United Engineering & Contracting Company. He emphasized that the entrance of the United States into the war means that our foreign commerce will not be blocked, but aided by the so-called economic conference which was held in Paris last year. Captain Hough left Petrograd just before the revolution in Russia took place and gave an intimate picture of personalities and conditions, which added conviction to his statement that the revolution had removed all obstacles to a new trade treaty between this country and Russia.

The other speakers at the luncheon were Dr. Boris Shatsky, professor of constitutional law at the University of Petrograd and commercial and financial representative in this country of the new Russian Government, and C. J. Medzikhovsky, commercial attaché to the Russian Embassy, 1 State Street, New York.

The Fleet of Submarine Dodgers

Not alone fulfilling the hope lately expressed, but doing so in record time, comes the announcement of the United States Shipping Board that plans are being worked out to provide cargo vessels of a total tonnage greater than that represented by what the German submarines are sinking. In THE IRON AGE of March 8 was described the plans proposed by F. Huntington Clark, a mining engineer, Roxbury, Conn., to build a large fleet of relatively small boats capable of dodging submarines if discovered or if armed of taking an offensive position, while at the same time defeating the objects of the undersea boats by keeping up the movement of freight. Now it is established that the board is working to build ships of wooden hulls of 3000 tons capacity each at a rate of 200,000 tons per month, beginning Oct. 1. THE IRON AGE wrote more prophetically than hopefully when in the issue mentioned it noted that "it is not unlikely the United States Shipping Board might see fit to apply its ship purchasing fund to participating in this venture."

William Denman, San Francisco, chairman of the Shipping Board, says: "We figure that with the supply of steel vessels at the command of the Allies they will be perfectly safe for eight or ten months, assuming the very highest destructivity of the submarine, and if it could be assured that by the end of that period the production of both steel and wooden ships would ex-

ceed the rate of destruction, the Germans would feel that their ruthless warfare was hopeless."

Official Announcement on Steel Prices

WASHINGTON, April 10, 1917.—Official announcement is made by the Navy Department that an agreement has been reached between Secretary of the Navy Daniels and J. A. Farrell, who is the vice-chairman of the special committee of the American Iron and Steel Institute, that there is to be no increase in prices over those paid for material used in the 1916 naval program. The conference was held on Friday last, and the Navy Department makes the following official statement concerning the agreement reached:

"A conference was held between Secretary of the Navy Daniels and J. A. Farrell, who is the vice-chairman of the special committee of the American Iron and Steel Institute recently appointed at the suggestion of the Council of National Defense for the purpose of facilitating the securing of material for the construction of ships and munitions. Mr. Farrell is president of the United States Steel Corporation. An agreement was reached with respect to prices for material for the shipbuilding program of the navy and additions to the naval stations. This agreement provides that there is to be no increase in prices over those paid for material used in the 1916 naval program. These prices are substantially lower than current prices and it is estimated that they involve a saving of approximately $18,000,000 on the tonnage required for 1917 over the prevailing prices."

It is understood that the prices agreed upon are 2.90c. Pittsburgh for plates and 2.50c. for bars and structural shapes.

Pig-Iron Prices

Answering THE IRON AGE'S question concerning probable developments in the pig-iron market, John Sergeant, president Domhoff & Joyce Company, Cincinnati, writes: "There are so many contingencies that may arise out of the declaration of war that it is difficult to forecast the future as far as the iron and steel business is concerned. The announcement that the Government will require large supplies of ferrous metal in different forms seems already to have had some effect, and within the past few days prices have advanced in all districts. The war demand will also come from hitherto unknown sources. And this, coupled with the urgent call for iron from regular consumers, is bound to increase the shortage that already exists, so that I cannot see anything except even higher prices ahead of us. Ample provision will be made for any of our employees who enlist for service during the war, and their positions will be held open for them."

Frank R. Rhodes, Eaton, Rhodes & Co., Cincinnati, says: "We certainly feel justified in predicting higher prices, but we have no means of guessing when the pinnacle will be reached."

Brass and Aluminum Committees

To deal with problems of brass and aluminum supply for the army and navy, the Council of National Defense has created the following committees to act in conjunction with the raw materials committee of the civilian advisory commission which acts with the council. Committees relating to other raw materials vital to the conduct of the war are being formed and will be announced later:

Brass.—Charles F. Brooker, American Brass Company, Waterbury, Conn.; C. D. Goss, Scovill Mfg. Company, Waterbury, Conn.; Lewis H. Jones, Detroit Copper & Brass Company, Detroit, Mich.; Barton Hazelton, Rome Brass Company, Rome, N. Y.; F. J. Kingsbury, Bridgeport Brass Company, Bridgeport, Conn.

Aluminum.—Arthur F. Davis, Aluminum Company of America, New York; E. E. Allyne, Aluminum Castings Company, Cleveland; Joseph A. Janney, Janney, Steinmetz & Co., Philadelphia.

Frank A. Scott Heads the Newly Created Munitions Board

The necessity for developing a compact organization specializing in the production and transportation of war material has been recognized by the Administration at Washington through the creation of a general munitions board by the Council of National Defense. The board will be headed by Frank A. Scott, Warner & Swasey Company, Cleveland, and will be composed of 20 members, 15 of them army and navy officers and the remainder civilians. Besides Mr. Scott, its civilian members are Bernard M. Baruch, Howard E. Coffin, Julius Rosenwald and Dr. Franklin Martin. From the army there are Brig. Gen. Thomas Cruse, Col. F. G. Hodgson, Col. H. Fisher, Lieut. Col. J. E. Hoffer, Maj. P. E. Pierce, Maj. Charles Wallace and Capt. A. B. Barker; from the navy: Rear Admiral H. H. Rousseau, Rear Admiral W. S. Capps, Comdr. R. H. Leigh, Comdr. T. A. Kearney, Dr. R. C. Holcomb, Paymaster J. H. Hancock and Lieuts. W. B. Lemly and L. McHowe.

Many Administration officials have considered the advisability of enlarging the Cabinet to make a place for a Secretary of Munitions. The officials advocating the new department emphasize the fact that it would not only relieve the war and navy departments of a vast amount of work, but would also form a basis for the co-ordination of the work of the Council of National Defense, the Chamber of Commerce of the United States and various other semi-official bodies now assisting in the war preparations. It is believed that the general munitions board just appointed will create machinery for a Government department of munitions with its head a cabinet minister if the conduct of the war brings the need. Officials say that active military and naval participation in the conflict will produce that necessity.

The immediate efforts of the board will be directed toward co-ordinating army and navy purchases and assisting in acquirement of raw materials for manufacture. It will study the country's manufacturing facilities and will establish precedence in army and navy orders. "It is not intended," said the announcement, "that the new board shall have the power to issue purchase orders or to bind the Government in contracts for purchases. These things will continue to be done by the respective Federal departments."

Mr. Scott, after the announcement of the creation of the board and the appointment of its members, issued a statement as follows:

"Notwithstanding the great efficiency of the army and navy and the tremendous efforts of the officers and personnel of both branches to meet the vast demands of the existing situation, the difficulties the board will have to encounter are very great. These difficulties are, however, such as are naturally inherent in our position as a non-military nation forced into war.

"That the difficulties will be overcome is not doubted by any who have witnessed the spontaneous outpouring of patriotic enthusiasm by all classes, or who have observed that in the case of manufacturers and business men generally this feeling already is making itself evident in practical ways in support of the Government."

British manganese ore imports in February, 1917, are reported as nearly 30,000 gross tons. The January receipts were 32,047 tons and the 1916 average was 36,625 per month.

ESTABLISHED 1855

THE IRON AGE

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Mobilizing

In all that has been said in the past two years of the possibilities of the United States being drawn into the great war, we have heard much of mobilization. The word has tripped readily from the tongue. In the past week the American people have come face to face with some of the first of its realities. The war news pages of this issue of THE IRON AGE give some hint of what it will mean to the steel and metal-working industries in the months that are to come. The country has entered upon the most momentous enterprise in its history. It knows little more to-day than that after a long period of rest from war it is now setting in motion its accumulated power in men, in money and in all the enginery of material resources "to make the world a safe place for democracy." No man can tell to what end the forces thus mobilized will come or when they will turn again to the pursuits of peace. The people of the United States have grim business in hand, with social, economic, industrial, political and spiritual consequences beyond the power of any mind to measure.

Negro Labor in the North

The perplexing problem of an adequate supply of common labor, in the past two or three years increasingly difficult, and one which now promises to become vital following the initial steps for raising a large army, has been solved to some degree in the Central West by the employment of negroes. Persons who have a view of the general field in the metal-working industries consider that negro labor brought from the South has proved satisfactory in the main, especially in steel and malleable foundries where unskilled workers under the direction of a competent foreman are a necessary part of the machinery of production.

The persistence of the negro, especially where the labor is arduous and attended with occasional exposure to extreme heat, has been questioned. So far the results in both the Cleveland and Chicago districts have been fairly good, although there is a tendency for the negro to return to the South when winter approaches. Foundry managers find that negroes can withstand heat better than white men. As a rule they are of a happy disposition while at work, but must be handled properly to make good workmen. It has been found that they are best controlled by a white man from the South who is familiar with their habits and characteristics. Lack of the right supervision is responsible for the failure of this class of labor in some places.

Because of the scarcity of common labor in the Cleveland foundries, the Founders' Association of that city has recently taken steps to obtain additional colored workmen from the South. In the Chicago district similar action has been taken by plant managers. Without design, perhaps, the railroads of the Middle West have rendered signal service to shop and foundry and steel works managers in augmenting the supply of negroes. Short of common labor themselves, they have brought many men from the South, at small cost of transportation, with a view to using them on track repair work and as freight handlers; but it was not long before these men were attracted by higher wages in other directions, and many have gone to the mills and foundries.

The influx of negroes in some localities has created a serious housing problem. This situation has developed in Chicago, where, as in most cities, a section of the city has been gradually given over to the negro population. The overcrowding has been such in these settlements in Chicago that the negroes have invaded other neighborhoods and the municipal authorities and real estate board have taken cognizance of the question. There are about 80,000 negroes in Chicago, and at least 10,000 have gone to the city since last fall. A plan for race segregation has been proposed, but the negroes are opposed to it. The friction which results when some of the more prosperous of them invade a residential district previously occupied exclusively by whites is not a new story. It usually means the rapid deterioration of land values to the distress of older residents of the district.

The willingness of the negro to leave the South has been due not only to the promises of higher wages made to him by labor agents, but also to the fact that the cotton crops have been poor for three seasons and his means of subsistence has been curtailed. Hundreds left the Alabama coal mines, which were slow to share the prosperity which has come to all industries. Their places were filled by recruits from the farms. The net result in the South is that while industrial plants have been able to keep a sufficient supply of negro labor through influx from the country, the land-

lord farm sections there are rapidly being abandoned, and farm labor probably will be scarcer in the coming year than has ever been known. So far, the South has not worried much over the situation, but Southerners have the opinion that the North is taking on a negro problem. The better class of negro who travels north is not going back, and the observation is made that the modern negro has developed the "money sense" to a degree not known by those of former generations.

Much is to be said in behalf of the negro and his reaching out to get a comfortable home. He is entitled to a place to live and well deserves it so long as he is serving industry and the community by doing useful and necessary work. The question is one to which municipal authorities and the larger industrial corporations may well give earnest thought, as several already are doing.

The Crop Outlook

In startling contrast with the usual cheerful prognostications as to growing crops is the report of the Department of Agriculture on the condition of this country's winter wheat crop on April 1. The weather throughout the winter wheat States has been decidedly unfavorable from the time the seed was planted. Precipitation has been scanty, whether in the form of rain or snow, while high winds have kept the ground unusually dry, and severe weather has checked the growth of such plants as had secured some sort of a start. The very high price prevailing for wheat ever since the breaking out of the European war has caused farmers to plant an increasing acreage yearly, and the winter wheat area of last autumn is estimated to have been 40,090,000 acres. Much of this ground will have to be abandoned, but probably a considerable portion of such abandoned wheat ground may be used in planting coarse grains. The department places the condition of winter wheat April 1 at 63.4 per cent of normal, which is the lowest point thus far recorded and compares with 78.3 per cent in 1916, 88.8 per cent in 1915 and 86.2 per cent, the ten-year average. The condition decreased 22.3 points from Dec. 1 to April 1, compared with an average decline of 4 points in the last ten years between those dates.

On the basis of these figures the 1917 yield of winter wheat is estimated at 430,000,000 bushels, against the actual harvesting of 481,744,000 bushels last year, thus forecasting a decrease of at least 50,000,000 bushels. In 1915 an exceptionally large yield of winter wheat was secured, amounting to 673,947,000 bushels. Such a yield was so phenomenally large that it could only be attained by the most favorable weather conditions from the time the seed was planted until the crop was ready to be harvested. A decline of almost 250,000,000 bushels from that high yield, however, is to be viewed with concern, in the light of the present condition of the food supply of the world. It is most unfortunate, not only for all the interests in this country dependent upon the wheat crop but also for the famishing people in other countries, that we cannot look forward to a large wheat crop this year. It is possible that the decline in the production of winter wheat may be offset to some extent by a greater acreage given over to other crops as the spring opens. The unfortunate conditions as to winter wheat have been revealed sufficiently early to cause more than ordinary energy to be applied to agriculture in the coming season. The National Government and the officers of the various State governments are awakening to this fact and systematic efforts will be made—and it is to be hoped successfully—to induce more persons than usual to give some of their time this season to the cultivation of the ground and the raising of articles intended for food.

The Selective Draft

The provision for selective drafting embodied in the plan of the War Department for increasing the army of the United States is being opposed in some quarters on the ground that recruiting should be done on an absolutely voluntary basis. It is contended that England greatly increased its army by appealing for volunteers, that Canada was also highly successful in following that policy and that the draft should be resorted to only as a last resort in this country. The principle of a selective draft is, however, one of the best features of the plan proposed for this country.

In recruiting the regular army and the National Guard to the size proposed by the Hay law of last year, men are to be obtained by the volunteer system and about 450,000 would have an opportunity to offer their services; but in the raising of an additional force of 500,000 and, in the discretion of the President, still other forces of 500,000 men each, the policy of selection is to be followed. This is designed to prevent the United States from making the tremendous blunder that was committed by England in accepting for service in the army many thousands of machinists and other workingmen who could render much better service to their country in workshops than in the trenches. In time, it was necessary to recall thousands of men from the trenches and put them to work in the shops of the British Empire. Naturally, when a general call for volunteers is sent out, the appeal to patriotism is strong, and able-bodied men of military age feel it a disgrace not to offer their services to their country. For this reason, machinists in large numbers are likely to be among the first to respond to the call to the colors. If, however, it is known that the Government has obtained the information as to the best field of usefulness for all men of military age and is selecting for service in the field only those who are not likely to be needed elsewhere, no man will feel that he is failing to do his duty if he quietly remains at home until called by the Government. The selective principle by all means should be retained in the legislation soon to be enacted by Congress.

Irregularities of Compensation

A recent bulletin issued by the Bureau of Labor Statistics, Washington, shows in a striking manner the wide differences in the provisions of workmen's compensation acts which have been passed by State legislatures. One important point brought out is that no State compensation act covers all employees.

and only two laws, those of New Jersey and Hawaii, cover as many as 90 per cent of the total workers, while one covers less than 20 per cent and nine less than 50 per cent. This is due in part to the fact that most of the acts are elective, but is accounted for largely by the intentional exclusion of certain classes of employees, such as agricultural workers, domestic servants and casual employees. Benefits paid in case of injury differ widely. In the case of a fatal injury in Oregon, the widow and children may receive as much as $13,480, but in Vermont the maximum is $1,830, and in Oklahoma no benefits at all are paid in case of death. The loss of a hand in Alaska may be compensated for to the extent of $2,640, but only $780 can be paid in Colorado. Even in definitions the legislators have not agreed, and such words as "accident" and "injury" have different meanings in different States. The California law recently was so amended as to include occupational diseases, and compensation for injuries resulting from such diseases has frequently been paid in Massachusetts.

The facts stated in the bulletin show the extreme difficulty of legislating by State action so that employees throughout the country will receive anything like uniform treatment. The tendency of Congress to encroach upon what many States consider their sacred rights is already bitterly resented and probably any attempt to pass a national compensation act would fail. The only alternative is for the States to study the various laws that have been passed and try to adopt the best features and reject those that have not proved to be wise. In facilitating the making of such comparisons the Bureau of Labor Statistics has rendered valuable service.

Manganese from Slags

The metallurgical and economical importance of slags from steel-making processes are only beginning to be realized. As with by-products in other industries, their availability is gaining in recognition. Values hardly thought of heretofore exist in several of their constituents.

Each year in the United States over 2,000,000 tons of basic slag is obtained from basic open-hearth steel furnaces, as an analysis of the subject elsewhere in this issue shows. Not less than 111,000 tons of oxide of manganese, or 85,000 tons of manganese, is contained in this slag. At least 80 to 90 per cent of it is wasted. Some steel makers have recognized the intrinsic worth of this slag and found a way to use it to advantage, providing lime in their blast-furnace burden and contributing iron as well as manganese. One producer estimates a loss of $8 per car to the open-hearth department for each car dumped. Another sells slag to the blast-furnace department at a fixed price per ton. The country's basic slag output represents at least 40,000 carloads, or a loss of $320,000 per year, if all is discarded. When it is recalled that the railroads now charge for removing all slag, the economic question involved grows in importance. But aside from these considerations, the better grade of pig iron produced is of increasing metallurgical significance as affecting the quality of the resultant steel.

The acid slag, both Bessemer and open-hearth, produced yearly is only about one-sixth the amount of basic slag. Its economic importance is therefore much less. While its use in blast-furnace burdens has not progressed as far, the possibilities are believed to be capable of expansion. The production from it, however, of a substitute for ferromanganese, so frequently advocated, does not look promising, even if practicable, for the amount of metallic manganese obtainable is small compared with a consumption in 1916 of over 240,000 tons of manganese in the 300,000 tons of alloy used. At $8 per car the waste of the 1913 acid slag output alone represented over $50,000. And to this is to be added the freight.

While the manganese in these slags would prove a slim dependence, were our foreign supplies of manganese ores cut off, valuable results are to be obtained from their judicious use.

German Steel Makers' Contributions to Employees' Families

The large sums which have been voluntarily subscribed by German iron and steel works for the support of their families are described as follows by *Stahl und Eisen:*

In the first year of the war 245 members of the Association of German Iron and Steel Manufacturers contributed an aggregate of about 50,000,000 marks in cash gifts, or in the form of payment of part wages, of house rent, or of fuel, food, cattle, or garden plots to the families of men called to the colors. War kitchens and public dining halls, where free meals were supplied, were started by some works, while others bought up large stores of provisions and sold them to the men's dependents below cost price. In the second year of war, 256 works, employing over 500,000 hands, voluntarily contributed over 92,000,000 marks. This sum was distributed to about 125,000 families, so that each family received an average of 500 marks in addition to the state and municipal support to which it was entitled.

French Iron and Steel Imports

French imports of iron and steel in the first 10 months of 1916 were greatly in excess of the corresponding period in 1915 as the following shows:

	To Nov. 1, 1915. Metric Tons	To Nov. 1, 1916. Metric Tons
Pig iron	92,421	532,644
Rolled steel	457,420	1,429,419
Tool steel	1,301	3,654
Special steels	850	2,232
Various sheets	54,965	236,192
Scrap	9,460	58,000

L'Echo des Mines (Paris) also states that 496,000 tons of iron ore was imported, of which 360,760 tons came from Spain, 69,400 tons from Italy, 18,400 tons from Algeria and 47,000 tons from other countries.

Idle Alabama Furnaces to Be Started

BIRMINGHAM, ALA., April 11, 1917.—(*By Telegraph.*)—Youngstown and Chicago people have bought Trussville furnace from the Michigan Trust Company, Grand Rapids, and will repair and operate it. It is announced in Talladega, Ala., that the Northern Alabama Iron & Railway Company of New York will repair and operate the long idle blast furnace there.

The Vulcan Steel Products Company, which was incorporated Sept. 27, 1916, reports that in the first six months of its operation it booked orders for over 75,000 gross tons of steel for foreign markets, nearly all of which has been shipped.

Publishers Offer Co-operation of "The Iron Age" and Other Journals

The assurance of co-operation with the Government for the most effective marshaling of leading industries in carrying on the war is given in the following letter addressed to the Council of National Defense by the United Publishers Corporation, New York:

NEW YORK, April 10, 1917.

Mr. Grosvenor B. Clarkson,
Secretary of the Council of National Defense,
Washington, D. C.

DEAR SIR: After consultation with our board of directors, the United Publishers Corporation has decided to offer to all departments of the United States Government the absolute co-operation of our industrial publications, covering many leading industries of this country, both in the matter of editorial co-operation and the free use of advertising space, for the purpose of assisting the Government in the mobilization of our industries, publicity in methods of finance and the promotion of any project undertaken by the Government during the present condition of war.

We cover the iron, steel and machinery industries through

THE IRON AGE.....New York
Hardware Age.....New York

The automobile and motor truck industry through the

Automobile.....New York
Motor Age.....Chicago
Commercial Vehicle.....New York
Motor World.....New York

The shoe industry through the

Boot and Shoe Recorder.....Boston

The building industry through the

American Architect.....New York
Building Age New York
Metal Worker.....New York

The dry goods field through the

Dry Goods Economist.....New York
Dry Goods Reporter.....Chicago
Drygoodsman.....St. Louis
Pacific Coast Merchant....San Francisco

We shall seek to interest the active co-operation of these important business interests in their local centers and shall hope to assist especially in placing the bond issue without expense to the Government.

In any of these matters your commands will receive our prompt and immediate attention.

Yours very truly,
H. M. SWETLAND,
President United Publishers Corporation.

Accident Reduction by Safety First Campaign

A decrease of 33 per cent in the total accidents per 1000 employees and 82 per cent in serious accidents per 1000 employees is the result of the safety first campaign which was inaugurated at the Berwick, Pa., plant of the American Car & Foundry Company, July 1, 1913. The first six months after the safety department was established the monthly average of accidents per 1000 employees was 52 and there were 17 serious accidents per month per 1000 employees. For the first six months of 1916 these figures were reduced to 35 and 3 respectively. In the past three years there have been only two fatalities in the plant and permanent injuries are almost a thing of the past.

Iron-ore exports from the Swedish port of Oxelosund in 1916 are reported as 1,500,000 tons compared with 1,200,000 tons in 1915, with 750,000 tons in 1914 and 1,000,000 tons in 1913.

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LESSONS OF THE EXPLOSION

Engineer Explains How Repetition of Eddystone Catastrophe May Be Avoided

THE explosion which occurred on Tuesday morning, April 10, at the plant of the Eddystone Ammunition Corporation, at Eddystone, Pa., a mile from Chester, resulting, as far as can be learned at this writing, in 115 deaths and 150 injured, some of the latter fatally, carries a lesson which a survey made that afternoon shows may be drawn for the general benefit of ammunition makers. G. F. Matteson, Ridley Park, Pa., a consulting engineer specializing in the design and manufacture of firearms, ammunition and instruments for artillery fire control, comments as follows:

Where the Explosion Occurred

The explosion occurred in Building F, which was entirely destroyed. This building was about 70 x 500 ft. and was separated into rooms by hollow tile partitions. In these rooms, connected by doorways, were performed the operations of loading the base charge and inserting powder pellets in shrapnel shells; filling the case with the propelling charge; assembling the case and shrapnel, and packing the rounds thus assembled in boxes for transportation. Under the same roof were also several automatic machines for compressing black powder into pellets for primers and shrapnel. The primers and fuses for Russian shrapnel are never assembled to the case and shell for transportation, otherwise the effects of the explosion would have been more serious, as several shrapnels were blown through adjoining buildings.

Steel fire walls were placed between and about 100 ft. distant from Building F and the powder storehouse, which normally contains many tons of smokeless powder. This fire wall was wrecked by the force of the explosion and the fire which followed. Heroic efforts of the employees' brigade prevented the fire from reaching this powder storehouse and thus prevented a more serious explosion.

Smokeless Powder Dangerous in Large Quantities

All plants handling explosives should be immediately inspected to guard against a repetition of this horror. Many of our ammunition plants are in charge of young military officers who have had but little experience in noting the precautions taken by private corporations which successfully handle explosives, and hence serious errors have been made which will lead to great losses unless immediately corrected.

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But this is not a commercial question. This is a question of getting ore at all and getting it without using up our shipping tonnage. It involves, unfortunately, the increasing of our number of blast furnaces. That means more labor for building and carrying on the work, and there is a very limited supply, in fact, there is no margin of supply of highly skilled men who work these blast furnaces. We have protected them against recruiting for months, but in spite of that fact, we are short of the necessary supply of labor for our blast furnaces.

There are mines in Lincolnshire, in Cumberland, and there are the famous Cleveland mines, all producing excellent ore; and if we could increase the labor in those mines we could augment by millions of tons a year the quantity of ore which can be produced in this country. Here, again, you require skilled as well as unskilled labor. I want to make a special appeal to both classes.

There are a certain number of mines which might be able to spare a few miners for this purpose. In those two directions we might be able to secure the necessary number of skilled men, and for the unskilled men we must trust the people of this country to place their services at the disposal of Neville Chamberlain for the purpose of assisting in this all-important task.

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In course of time the contracts ran out and, by a good many firms, no attempt was made to obtain new ones; first, because of unprofitableness and second, because the war had created so large a demand for the regular output as to make it doubtful if new munition orders could be taken care of. Then the Government proceeded to levy a 12½ per cent tax on profits derived from these orders. As this tax did not consider the yearly profits on the business as a whole, it became necessary for each manufacturer to determine the exact difference between the cost and the selling price of the munitions.

In order to be able to continue a comparison of costs, many accountants had not advanced the overhead charges to the point of actual cost when estimating. It was conceded that, except in the case of producers of raw material, no business at all could be obtained if quotations went beyond a certain limit, say nominal cost plus 25 per cent. The excess cost might absorb all of that 25 per cent or it might leave a slight margin, but either result would be better than retiring from the market altogether.

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While it appears justifiable to load the cost to the limit with every item which can be fairly charged against it, on the other hand if disputes arise with the Government its agents would be justified in claiming that the abandonment of the general practice for figuring jobs and using another basis for figuring this one was for the purpose of reducing the taxable profit. The writer believes that few, if any, returns have been made up on the second proposition, as our pride would impel us to show a profit if at all possible.

The computing of tax on profits derived from the manufacture of foreign munitions has compelled us to scrutinize closely our cost methods, and one of the lessons we have learned from that work is that in order to protect both the Government and the manufacturers, in the event of contracts being awarded for our own munitions, it is essential that a uniform system be followed in determining those costs. H. D. MURPHY.

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LESSONS OF THE EXPLOSION

Engineer Explains How Repetition of Eddystone Catastrophe May Be Avoided

THE explosion which occurred on Tuesday morning, April 10, at the plant of the Eddystone Ammunition Corporation, at Eddystone, Pa., a mile from Chester, resulting, as far as can be learned at this writing, in 115 deaths and 150 injured, some of the latter fatally, carries a lesson which a survey made that afternoon shows may be drawn for the general benefit of ammunition makers. G. F. Matteson, Ridley Park, Pa., a consulting engineer specializing in the design and manufacture of firearms, ammunition and instruments for artillery fire control, comments as follows:

Where the Explosion Occurred

The explosion occurred in Building F, which was entirely destroyed. This building was about 70 x 500 ft. and was separated into rooms by hollow tile partitions. In these rooms, connected by doorways, were performed the operations of loading the base charge and inserting powder pellets in shrapnel shells; filling the case with the propelling charge; assembling the case and shrapnel, and packing the rounds thus assembled in boxes for transportation. Under the same roof were also several automatic machines for compressing black powder into pellets for primers and shrapnel. The primers and fuses for Russian shrapnel are never assembled to the case and shell for transportation, otherwise the effects of the explosion would have been more serious, as several shrapnels were blown through adjoining buildings.

Steel fire walls were placed between and about 100 ft. distant from Building F and the powder storehouse, which normally contains many tons of smokeless powder. This fire wall was wrecked by the force of the explosion and the fire which followed. Heroic efforts of the employees' brigade prevented the fire from reaching this powder storehouse and thus prevented a more serious explosion.

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Iron and Steel Markets

WAR MARKET TENDS UP

Low Prices on Government Contracts

Fuller Employment of the Industry Under War Demand—Pig Iron Advances Sharply

Higher prices for pig iron and finished steel, greater scarcity of labor and hence further wage advances, increased demand upon all steel and metal-working capacity to fill enormous orders of the Government—all are indicated by the developments of the first week of the war.

The steel trade, to begin with, has to deal with 300,000 tons of Government orders for navy and other shipyard work. As much more for like work will be placed later. That the prices arranged—2.90c. for plates and 2.50c. for bars and structural shapes—are less a hardship for the Steel Corporation than for any other manufacturer goes without saying. How this low-priced tonnage will now be distributed is yet to be worked out. The committee of manufacturers presumably will take account of the wide differences in costs in assigning Government steel, as for some smaller mills the prices named are perilously near the present cost line.

The naming of a manufacturer well known in metal-working lines as head of the newly created munitions board at Washington is so far reassuring, in all the confusion of placing vast army and navy orders. Changes in buying methods in both departments are sorely needed at this juncture.

The labor problem is giving no little concern. Workers released by the expiring of foreign munitions contracts are being absorbed by other lines of industry. When later the Government places war orders on a large scale, many of these workers will be drawn back, but meanwhile recruiting will add to the scarcity of shop labor. Costs will increase at the same time that Government orders carry prices far below those secured on the expiring European contracts.

Filling the immediate requirements of the Government does not appear formidable, considering the present output of more than 43,000,000 tons of steel ingots a year. But the demands upon iron and steel works directly and indirectly due to the billions of dollars the Government and its Allies will spend with American manufacturers in the coming year point to the fullest employment of capacity. The question of increasing output is largely one of coke, and the coke problem is still a serious one.

That the Steel Corporation, with a larger output in March than in three preceding months, still added 135,000 tons to its unfilled orders, is definite proof of the great strain upon the industry.

Highly significant are the week's advances in pig iron and scrap. The trade is questioning what is ahead when basic pig iron leaps from $35 to $40 at Valley furnace in a single week, with Bessemer iron advancing from $39 to $42, while old material, under purchases of 50,000 tons or more by the Carnegie Steel Company, is higher by $2 to $3 a ton. In the Middle West one steel company was able to buy basic iron last week at $35 for the third quarter; this week $38 was the lowest quotation available and the majority of sellers held for $40.

While predicting higher prices, pig-iron producers continue to sell for the first half of 1918 at $3 to $4 below the level for early delivery. Southern furnaces are less disposed to make such differential, one interest there having offered to take on 100,000 tons for 1918 delivery at $35, Birmingham, for No. 2.

On 1917 pig iron, advances of $1 to $2 a ton have been made in the past week in all markets. The amount to be had is relatively small, but these sales are steadily pulling up the price of forward delivery iron.

Talk of famine prices in ferromanganese has been somewhat overdone, but the upward tendency is indicated by $1 and $1.10 unit prices for manganese ore. The rising market for spiegeleisen is another indication. Inquiry for about 10,000 tons of 20 per cent product is pending.

Prices on semi-finished steel, especially open hearth, are advancing rapidly. Sheet bars for early delivery have sold at $80 at mill. Yet now and then a lot of billets has been offered for export quite below the market, indicating considerable variation in the sold-up condition of producers.

Even more irregularity has developed at times in prices of plates and structural material. In the fixing of the Government's 2.90c. price on plates at Washington last week some of these irregularities came into the reckoning.

The tense situation in tin plate is shown in the increasing disposition of certain makers to ask more than $7.50. Offers of consumers point the same way, more than $8.50 having been named in one case.

The wire advance is still delayed, but there are indications of a higher market.

Pittsburgh

PITTSBURGH, PA., April 10, 1917.

Large Government contracts for sheets, structural steel, plates and steel bars have been placed, estimates putting the total as high as 300,000 tons. Negotiations are under way between the steel mills and the Government for more contracts, which may be closed this week. It is said that Judge Gary of the Steel Corporation has been asked to represent the Government in the negotiations for steel not only with his own company, but with the other steel companies. As yet none of the steel companies has finally decided what will be done in regard to paying employees who may enlist. When the National Guard was on duty at the Mexican border the steel companies paid their men who had enlisted the difference between what they had been earning and what the Government paid them, so that their earnings were maintained. It is likely the same policy may now be pursued. Local steel officials, while declining to go on record as to what will be the immediate effect of the war with Germany on the steel trade, are generally of the opinion that it will put prices much higher and cause greater delays in deliveries of material to domestic consumers. This will

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	April 11, 1917.	April 4, 1917.	Mar. 14, 1917.	April 12, 1916.
No. 2 X, Philadelphia	**$41.00**	$40.00	$36.50	$20.50
No. 2, Valley furnace	**40.00**	38.00	36.00	18.50
No. 2 Southern, Cin'ti	**37.90**	35.90	31.90	17.90
No. 2, Birmingham, Ala.	**35.00**	33.00	29.00	15.00
No. 2, furnace, Chicago*	**39.00**	38.00	35.00	19.00
Basic, del'd, eastern Pa.	**38.00**	36.00	33.50	20.50
Basic, Valley furnace	**40.00**	35.00	32.00	18.25
Bessemer, Pittsburgh	**42.95**	39.95	36.95	21.95
Malleable Bess., Ch'go*	**39.00**	38.00	35.00	19.50
Gray forge, Pittsburgh	**37.95**	35.95	32.95	18.70
L. S. charcoal, Chicago	38.75	38.75	36.75	19.75
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	38.00	38.00	38.00	28.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	30.00
Bess. billets, Pittsburgh	**75.00**	70.00	65.00	45.00
O.-h. billets, Pittsburgh	**75.00**	70.00	65.00	45.00
O.-h. sheet bars, P'gh	**77.50**	72.50	65.00	45.00
Forging billets, base, P'gh	**100.00**	90.00	90.00	67.50
O.-h. billets, Phila.	70.00	70.00	65.00	50.00
Wire rods, Pittsburgh	85.00	85.00	80.00	60.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia	3.659	3.659	3.659	2.659
Iron bars, Pittsburgh	3.50	3.50	3.50	2.50
Iron bars, Chicago	3.25	3.25	3.00	2.35
Steel bars, Pittsburgh	3.75	3.75	3.75	2.75
Steel bars, New York	3.919	3.919	3.919	2.919
Tank plates, Pittsburgh	5.75	5.75	5.25	3.75
Tank plates, New York	5.919	5.919	5.419	3.919
Beams, etc., Pittsburgh	3.75	3.75	3.40	2.50
Beams, etc., New York	3.919	3.919	3.569	2.769
Skelp, grooved steel, P'gh	**5.25**	4.75	3.50	2.35
Skelp, sheared steel, P'gh	**5.50**	5.00	3.75	2.45
Steel hoops, Pittsburgh	4.25	4.25	4.00	3.00

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	April 11, 1917. Cents.	April 4, 1917. Cents.	Mar. 14, 1917. Cents.	April 12, 1916. Cents.
Sheets, black, No. 28, P'gh	5.50	5.50	5.00	2.85
Sheets, galv., No. 28, P'gh	7.25	7.25	7.00	5.00
Wire nails, Pittsburgh	3.20	3.20	3.20	2.40
Cut nails, Pittsburgh	3.75	3.75	3.70	2.60
Fence wire, base, P'gh	3.15	3.15	3.15	2.25
Barb wire, galv., P'gh	4.05	4.05	4.05	3.25
Old Material, Per Gross Ton:				
Iron rails, Chicago	**$31.00**	$29.00	$28.00	$18.00
Iron rails, Philadelphia	**31.00**	30.00	28.00	20.00
Carwheels, Chicago	**24.00**	22.50	20.25	14.00
Carwheels, Philadelphia	25.00	25.00	21.00	17.50
Heavy steel scrap, P'gh	**30.00**	27.00	22.00	18.00
Heavy steel scrap, Phila.	**25.00**	24.50	23.50	18.00
Heavy steel scrap, Ch'go	**27.00**	26.00	24.00	16.50
No. 1 cast, Pittsburgh	**24.00**	23.00	20.00	16.00
No. 1 cast, Philadelphia	**26.50**	25.00	21.00	18.00
No. 1 cast, Ch'go (net ton)	**20.25**	19.25	16.50	13.00
No. 1 RR. wrot, Phila.	**35.00**	34.00	30.00	23.50
No. 1 RR. wrot, Ch'go (net)	29.50	29.50	26.00	17.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	**$8.00**	$7.50	$9.50	$2.65
Furnace coke, future	**8.00**	7.00	7.00	2.90
Foundry coke, prompt	**10.00**	9.50	11.00	3.75
Foundry coke, future	**9.00**	7.50	7.50	3.50
Metals,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	*33.00*	34.00	36.00	28.00
Electrolytic copper, N. Y.	*33.00*	34.00	36.00	27.75
Spelter, St. Louis	*10.00*	10.50	10.50	18.75
Spelter, New York	*10.25*	10.75	10.75	19.00
Lead, St. Louis	9.15	9.15	9.50	7.87½
Lead, New York	9.35	9.35	9.50	7.87½
Tin, New York	**54.62½**	54.25	53.50	53.00
Antimony (Asiatic), N. Y.	36.00	36.00	31.00	43.00
Tin plate, 100-lb. box, P'gh	$8.00	$8.00	$8.00	$4.50

result from the fact that Government orders for steel will have to be turned out for special delivery. Advances in prices during the week have been sensational, and indications point to still higher prices. Bessemer pig iron has sold at $42 and basic at $40, Valley furnace. Open-hearth sheet bars are said to have sold as high as $80, maker's mill. Some grades of ferroalloys are up $5 per ton. The minimum price on sheared plates is now regarded as 5.50c., and sales have been frequent at 6c. and higher. Old material of all kinds is up $2 to $3 per ton, due largely to the purchase of about 50,000 tons of steel scrap by the Carnegie Steel Company. Nuts and bolts will be advanced this week 10 per cent or more, and announcement is expected at any time of a heavy advance in wire products.

Pig Iron.—Sensational advances have taken place in Bessemer, basic, foundry, and other grades of pig iron. A week ago basic iron sold at $35, Valley furnace, and to-day (Tuesday) it sold at $40. Bessemer iron has sold at $42, and may reach $45 before this week is out. We note two sales of 3000 tons each of Bessemer iron at $40, and another of 1000 tons and one of 3000 tons at $42, Valley furnace. There have been four or five sales of basic iron in lots of 1000 to 3000 tons at $40, Valley furnace. Sales of No. 2 foundry have been made at $40, Valley furnace, with some sellers asking higher prices. There is a scarcity in the supply of both Bessemer and basic iron. We quote: Standard Bessemer iron, $42; basic, $40; malleable Bessemer, $39 to $40; No. 2 foundry, $40 to $42, and gray forge $37 to $38, all at Valley furnace, the freight rate for delivery to the Pittsburgh and Cleveland districts being 95c. per ton. The Standard Sanitary Mfg. Company has bought 7500 to 10,000 tons of No. 2 foundry at $39, Valley furnace, for the second quarter, taking up an option secured some days ago, but it would not now be possible to buy under $40.

Billets and Sheet Bars.—Prices on semi-finished steel, especially open-hearth, are advancing rapidly. A sale is reported of about 2000 tons of open-hearth sheet bars for fairly prompt delivery at $80, makers' mill. The Government will be a large consumer of open-hearth steel in its war orders, and this, with the congested condition of the mills, on both Bessemer and open-hearth steel, is largely responsible for the heavy advances in prices. Fortunately, most consumers are covered by regular contracts on which shipments are fairly good, but those who have to buy billets or sheet bars will be obliged to pay fancy prices, and even then they may not be able to get them. We quote soft Bessemer and open-hearth billets and sheet bars at $75 to $80 per ton, maker's mill, Pittsburgh or Youngstown; forging billets, $100 to $110 for sizes up to but not including 10 x 10 in., and for carbons up to 0.25.

Ferralloys.—Domestic 80 per cent ferromanganese is quoted at $325 to $350 at furnace, and 50 per cent ferrosilicon in small lots for prompt shipment is $250 or higher. Prices on Bessemer ferrosilicon have been again advanced $5 per ton, and only two makers are quoting, the other two having retired from the market. We quote 18 to 22 per cent spiegeleisen at $75 to $80 and 25 to 30 per cent at $85 to $90, delivered. We quote 9 per cent Bessemer ferrosilicon at $59; 10 per cent, $60; 11 per cent, $62; 12 per cent, $65; 13 per cent, $70; 14 per cent, $75; 15 per cent, $80; and 16 per cent, $85. We quote 7 per cent silvery iron at $46 to $47; 8 per cent, $47 to $48; 9 per cent, $49 to $50; 10 per cent, $50 to $51; and 11 and 12 per cent, $52 to $53, all f.o.b. at furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having uniform freight rates of $2 per gross ton for delivery in the Pittsburgh district.

Structural Material.—Inquiry is but moderate, and it is said some of the small fabricating shops are running short of work. The larger shops are filled up for some months. The American Bridge Company has taken 3000 tons for transmission towers to be erected for the Electric Bond & Share Company, in North Carolina, and the McClintic-Marshall Company 3000 tons for a power house for the American Gas & Electric Company, Windsor, W. Va. The Jones & Laughlin Steel Company has taken about 200 tons of grade crossing work for the Michigan Central. We quote beams

and channels up to 15 in. at 3.60c. to 3.75c. for extended delivery, while small lots from warehouse are quoted at 4.25c. to 5c., depending on quantity.

Plates.—The bottom price on ¼-in. and heavier sheared plates now seems to be 5.50c. at mill for reasonably prompt delivery, with some mills quoting 6c. The Government orders that will come to the mills are likely to put prices still higher, as they interfere more or less with shipments to domestic consumers. Railroads are buying very little equipment either steel cars or locomotives. The only order for steel cars out the past week was for 2000 freight cars and 500 box cars for the Philadelphia & Reading, to be built by the American Car & Foundry Company, the same road having placed 500 box cars with the Pullman Company, and 500 steel gondolas each with the Standard Steel Car Company and the Pressed Steel Car Company. We quote ¼-in. and heavier sheared plates at 5.50c. to 6c. at mill, and ship plates from 8c. to 9c. at mill. Small lots of plates from warehouse bring 6.50c. to 7c. and higher.

Sheets.—Demand from the Government for large quantities of high grade sheets, to be made up into helmets, cartridge cases, tent stoves, buoys, and other purposes, is making its appearance. The Government has already placed large orders for tent stoves in which sheets will be used. This is naturally firming up prices still more on all grades of sheets, and it is doubtful if any mills will sell extensively at the prices named last week by the American Sheet & Tin Plate Company. It is known that the minimum price of some mills on No. 28 Bessemer black sheets is 6c., and it is said sales have been made at higher prices. It looks very much as though there will be a decided shortage in the supply of sheets in the next six months, if it is not already here. We quote blue annealed sheets, Nos. 3 to 8, at 4.95c. to 5.50c.; box annealed, one pass Bessemer, cold rolled, No. 28, 5.50c. to 6c.; No. 28 galvanized, 7c. to 7.50c.; No. 28 black plate, tin-mill sizes, 5.50c. to 6c.; all f.o.b. mill, Pittsburgh. These prices are for carloads and larger lots, for shipment over the third quarter and last half of this year. The higher prices given are for fairly prompt delivery.

Tin Plate.—Some manufacturers contend that with the uncertainty as to prices of pig tin and the decided certainty that labor and steel will be much higher, the prices of $7.50 per box on Bessemer and $7.75 on open-hearth tin plate, as named last week by the American Sheet & Tin Plate Company, are too low. Several have stated that only to their trade that is in competition with several of the leading can makers will they be willing to sell for last-half delivery at $7.50 and to their general trade it is their intention to charge $7.75 to $8 and possibly more. It is feared that there may not be enough tin plate this year to meet the demand and the leading companies are allotting their output for the last half of this year among their customers as best they can. The export demand is heavy, one inquiry coming yesterday for 150,000 boxes and another for 48,000 boxes for shipment to the Orient, but makers say they will not think of quoting on these inquiries. We now quote tin plate, 14 x 28, at $7.50 to $7.75 per base box for last half of the year delivery. On small current orders mills are quoting $8 to $8.25 for primes and wasters, per base box, at mill. We quote long-terne plate, No. 28 gage base, at $7 to $7.25; short-terne plate, $11.50 to $12, makers' mill, prices depending on quantities and deliveries wanted. The full schedule of prices adopted by the American Sheet & Tin Plate Company on terne plates is as follows: 8-lb., 200 sheets, $14 per package; 8-lb., 214 sheets, $14.30 per package; 12-lb., I. C., $15.25 per package; 15-lb., I. C., $15.75 per package; 20-lb., I. C., $16.50; 25-lb., I. C., $17.25; 30-lb., I. C., $18; 35-lb., I. C. $18.75; 40-lb., I. C., $19.50.

Steel Rails.—No large orders for standard sections are coming out, and the rail manufacturers say they do not want them. Their capacity is sold up for this year and for 1918 on products that afford a very much larger profit than rails. The new demand for light rails is quite active, coming mostly from coal-mining companies. We quote splice bars at 2.25c., at mill when sold in connection with orders for standard section rails, and on carload and smaller lots, 3c. to 3.25c. We quote light rails as follows: 25 to 45 lb., $55; 16 to 20 lb., $56; 12 and 14 lb., $57; 8 and 10 lb., $58; in carload lots, f.o.b. mill, with the usual extras for less than carloads. Standard section rails of Bessemer stock are held at $38, and open-hearth $40, per gross ton, Pittsburgh.

Shafting.—The new demand is good and makers report specifications against contracts coming in quite freely. On 1½-in. and 3-in. rounds, makers of shafting are able to promise deliveries in six to eight weeks, but on hexagons and squares deliveries are not made under four to five months. It is likely that large quantities of shafting will be used in the manufacture of fuses for the Government, and it is said some orders have already been placed with local makers, who have been enjoined not to give out any information regarding them. Discounts are ruling around 10 to 15 per cent off the list, the greater discounts being obtainable only by the large consumers.

Railroad Spikes and Track Bolts.—The spike market is quiet and specifications on contracts are not active. Local spike makers are pretty well filled up for the next four or five months. The new demand for track bolts is quite heavy and prices are again higher. We quote track bolts with square nuts at 5.35c. to 5.50c. to railroads and 5.50c. and up to 7c. and 8c. in smaller lots for prompt shipment. Railroad spikes, 9/16 in. and larger, are $3.65, base; 7/16 and ½ in., $3.75, base; 5/16 and ⅜ in., $4, base. Boat spikes are $3.90, base, all per 100 lb., f.o.b. Pittsburgh.

Wire Products.—It is evident that some consumers expected an advance, to be effective probably from April 9, as contracts in the past week have been heavy. No announcement of an advance has been made as yet, but one is expected, as prices on other kinds of finished steel are advancing rapidly. It is stated that two makers have practically withdrawn prices, quoting only on specific inquiries from regular customers. Mills report good specifications against contracts. All are well sold up for the next three or four months, and there is a scarcity in the supply of the sizes of nails more commonly used. At this writing prices are as follows: Wire nails, $3.20 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2 and shorter than 1 in., $2.50. Bright basic wire is $3.25 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.15; galvanized wire, $3.85; galvanized barb wire and fence staples, $4.05; painted barb wire, $3.35; polished fence staples, $3.35; cement-coated nails, $3.10 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 51 per cent off list for carload lots, 50 per cent off for 1000-rod lots and 49 per cent off for small lots, f.o.b. Pittsburgh.

Wire Rods.—The demand is heavy from England, France and Spain. Ordinary soft open-hearth rods are said to have sold for export at about $100 per ton at mill. Recently some large users of chain rods were allowed to cover on their needs for the second quarter at prices much below the open market. Makers of rods realized that the chain manufacturers could not pay $80 and $85 for rods and meet competitive conditions in the chain market. We now quote soft Bessemer and open-hearth rods to domestic consumers at $85, but chain rods could likely be bought lower by regular customers. We quote high carbon rods made from ordinary open-hearth steel at $90 to $100, and special steel rods, with carbons in these running from 0.75 to 0.90, at $100 to $115 at mill. Heavy shipments of rods are being made into Canada on contracts taken some time ago.

Boiler Tubes.—As noted in this report for some weeks, discounts quoted on either iron or steel boiler tubes do not represent actual prices, but are much below them. This condition arises from the fact that most makers of both steel and charcoal iron tubes are

sold up for a year or more ahead, and any that are in position to take orders for reasonably prompt delivery are easily getting much higher prices. One large producer states that for weeks it has been selling its entire output of charcoal iron boiler tubes in carload and less than carload lots for early or future delivery, at prices from 50 to 100 per cent higher than the list on smaller diameters, and 10 per cent or more above the list on larger sizes. The demand for both steel and charcoal iron tubes continues heavy, and some large consumers have contracted at high prices for their supply for delivery over the first half of 1918. Discounts on steel and iron tubes, which are purely nominal, are given on another page, but no discounts whatever are available on 3½ and 4½ in.

Iron and Steel Bars.—An abnormally heavy demand for steel bars is coming from the trade that has not yet covered on its needs for the last half of this year. However, most large consumers are covered, and their specifications are coming in freely. The demand for reinforcing steel bars is not very heavy, due to the high prices for building materials and labor, which have restricted building operations. Makers of iron bars report the demand active, and state that prices are likely to be higher in the near future, due to the heavy advance in prices on iron for puddling. We quote steel bars at 3.35c. at mill, with no promise of definite delivery, and 3.50c. to 3.75c. for shipment in two to three months. We quote refined iron bars at 3.50c., and railroad test bars 3.65c. at mill in carload lots.

Hoops and Bands.—The demand is excellent, although most consumers are covered over the second and third quarters, and some of the larger ones over the remainder of the year. The Carnegie Steel Company's price on steel bands is 3.35c., with extras as per the steel-bar card, but with no promise of deliveries this year. Other makers that can ship out bands in the second and third quarters are quoting 3.50c. to 3.75c. at mill. Prices of steel hoops continue to range from 4c. to 4.50c. at mill, depending entirely on the deliveries, the customer, and the quantity involved.

Nuts and Bolts.—It is likely that in a few days the prices of all kinds of nuts and bolts will be advanced 10 per cent or more. Makers say the new demand is heavy, and they are back in shipments 10 to 12 weeks or longer. The export demand is also strong. On some export business recently placed, as high as $20 per ton over domestic prices was obtained. Discounts in effect at this writing are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days:

Carriage bolts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 and 2½ per cent; large, 30 and 5 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 50 per cent; small, cut thread, 40 and 10 per cent; large, 35 and 5 per cent.

Machine bolts, c. p. c. and t. nuts, small, 40 per cent; large, 30 per cent. Bolt ends, h. p. nuts, 35 and 5 per cent; with c. p. nuts, 30 per cent. Lag screws (cone or gimlet point), 50 per cent.

Nuts, h. p. sq. and hex., blank, $2.50 off list, and tapped $2.30 off; nuts, c.p.c. and t. sq., blank, $2.10 off, and tapped, $1.90 off; hex., blank, $2.25 off, and tapped $2 off. Semi-finished hex. nuts, 50, 10 and 5 per cent. Finished and case-hardened nuts, 50, 10 and 5 per cent.

Rivets 7/16 in. in diameter and smaller, 40 and 10 per cent.

Cold-Rolled Strip Steel.—Nearly all consumers are fully covered on their needs for the second quarter, and some for the third quarter. Pressure is being brought against the mills by consumers to take their contracts over the second half of the year, but thus far most makers are refusing to sell beyond July 1, except to a few manufacturers who have to know for a longer period ahead what their steel is to cost. Specifications are active and the current demand for small lots is good. For second-quarter delivery we quote cold-rolled strip steel at $7 to $7.25 per 100 lb. on current orders. For reasonably prompt shipment mills are getting $7.25 to $7.50 and higher. Terms are 30 days net, less 2 per cent for cash in 10 days, delivered in quantities of 300 lb. or more when specified for at one time.

Rivets.—Prices are very strong and an early advance is expected. While the demand is active, most consumers are covered over the second quarter, and some over all of this year. Specifications are good. Regular shipments of rivets are being made to Japan and other countries when bottoms can be obtained, and at higher than domestic prices. Makers quote button-head structural rivets, ½ in. in diameter and larger, $4.75 per 100 lb., base, and conehead boiler rivets, same sizes, $4.85 per 100 lb., base, f.o.b. Pittsburgh. Terms are 30 days net, or ½ of 1 per cent off for cash in 10 days.

Wrought Pipe.—Conditions in lap-weld iron and steel pipe are fast getting to be the same as have existed for so long in steel plates. Mills are simply being flooded with offered business on which they are unable to quote, being sold up for all of this year, and some have orders on their books for shipment in 1918. It is said there are inquiries in the market for 100,000 tons or more of line pipe on which the mills refuse to quote, as they cannot take care of even part of this business. In butt-weld iron and steel pipe the mills are not sold up so far ahead and can make shipments in eight to ten weeks. There is no doubt that heavy premiums over regular prices for lap-weld and line pipe would readily be paid by consumers if they could find mills that would accept the business. Discounts in effect from April 2 are given on another page.

Old Material.—Prices on all grades of iron and steel scrap have shown sharp advances, due largely to the purchase of 50,000 tons or more of heavy steel scrap by the Carnegie Steel Company late last week, all of this being for the Homestead works at Munhall. Two leading local dealers are credited with having sold the company about 30,000 tons, while the other 20,000 tons came from the railroads and from mills that make more scrap than they use. These heavy purchases have put up prices on open-hearth steel scrap about $3 per ton, the Carnegie Company having paid as high as $30 delivered, and other grades have gone up $2 to $3. Another reason for the heavy advances in scrap is the high market on basic pig iron. Dealers insist that scrap prices are going still higher. Consumers that a week ago were not interested are now anxious to buy, but are finding scrap hard to obtain. Borings and turnings are up about $2 per ton and low-phosphorus melting scrap nearly $3 per ton. Dealers that have any scrap in their yards say they will hold it, as they are sure of getting more money for it. Prices for delivery in Pittsburgh and at other consuming points that take Pittsburgh freight rates, per gross ton, are nominally as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh, delivered	$30.00 to $31.00
No. 1 foundry cast	24.00 to 25.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	34.00 to 35.00
Hydraulic compressed sheet scrap	22.00 to 23.00
Bundled sheet scrap, sides and ends, f.o.b. consumers' mills, Pittsburgh district	19.00 to 20.00
Bundled sheet stamping scrap	17.00 to 18.00
No. 1 railroad malleable stock	26.00 to 27.00
Railroad grate bars	15.00 to 16.00
Low-phosphorus melting stock	37.00 to 38.00
Iron car axles	45.00 to 46.00
Steel car axles	45.00 to 46.00
Locomotive axles, steel	50.00 to 52.00
No. 1 busheling scrap	21.00 to 22.00
Machine-shop turnings	13.75 to 14.25
Old carwheels	25.00 to 26.00
Cast-iron borings	14.50 to 15.00
Sheet-bar crop ends	33.00 to 34.00
No. 1 railroad wrought scrap	31.00 to 32.00
Heavy steel axle turnings	18.00 to 18.50
Heavy breakable cast scrap	22.00 to 22.50

Coke.—Some heavy inquiries for furnace coke for last-half delivery are in the market, but so far no contracts have been closed. Several furnace operators have indicated they might be willing to pay $6.50 to $7 per net ton at oven for high grade coke, but the producers figure they may get $8 or more. Several Shenango Valley furnaces and three Eastern consum-

ers of coke are anxious to close for the last half, and the producers have indicated they might be ready to name prices early in May. Yesterday and to-day there were sales of possibly 3000 to 4000 tons of furnace coke at $8 to $8.50 per net ton at oven. Good contracts for 72-hr. foundry coke for last-half delivery have been made at $9 per net ton at oven. We quote high quality furnace coke for prompt shipment at $8 to $8.50 and on contracts for last half of the year $8, this being the asking price. We quote best grades of 72-hr. foundry coke for prompt shipment at $9.50 to $10 and on contracts for last half of the year $9. The Connellsville *Courier* gives the output of the upper and lower Connellsville regions for the week ended March 31 as 369,790 net tons, an increase over the previous week of 1045 tons.

Chicago

CHICAGO, ILL., April 10, 1917.

The situation is difficult to interpret, for the reason that nearly every one is wondering what problems the future will bring, with only conjecture as a starting point. In the main, optimism rules. No one seems to be worried as to what percentage of the country's iron and steel production the Government will require, but there is some apprehension as to the effect which the prices made for the Government will have on the general market. It is pointed out that to abuse power is a natural tendency, and fear exists in some minds that the Government, in some cases at least, may not be willing to allow a price which will preclude loss. A more cheerful view is that the mills supplying the Government at reduced prices are merely placing it in the position of a contract customer. It is conceded that many customers are being supplied on contracts at prices far below present levels. The scrap interests have in some cases expressed doubt as to the ultimate effect on their business, inasmuch as old material at the prices now ruling can hardly go into low-priced steel without a loss somewhere. Meanwhile, with all the uncertainty, it remains truer than ever that the mills have but little to sell for the remainder of the year. Pig iron is stronger, the minimum for Northern iron now being $39, Chicago, and for Southern $38, Chicago. Some makers of charcoal iron are also quoting higher prices, and getting them. The quotations for finished steel products have changed but little so far as the mills are concerned, although jobbers have made advances in plates, sheets and rivets. Prices of old material have been advanced radically.

Pig Iron.—The market is stronger, with a steady run of inquiry for delivery this year and next, a noticeable feature being the number of consumers whose wants for the remainder of this year were supposed to be covered, but who are now asking for quotations. Northern iron, both prompt and for delivery this year, is now held at $39, furnace, last week's quotation of $38 having been left behind. This price also applies to northern malleable Bessemer and basic. In some directions $35, Chicago, is quoted for the first half, although one maker at least asks $36 for this position, and is endeavoring to discourage business that far ahead. The latter interest has found less inquiry in the past week for 1918 delivery than existed a week ago. How long the minimum of $35 for first half will be adhered to depends on the extent to which buying develops, but the trend is upward. The minimum for No. 2 Southern appears to be $34, Birmingham, or $38, Chicago, for delivery this year, prompt or otherwise, while for the first half the minimum is $32, Birmingham, or $36, Chicago. For prompt $35, Birmingham, is said to have been offered. In a general way, Southern iron is scarce. One large interest which has been out of the market for some time was expected to reopen its books about April 1, but has not yet done so. Altogether, inquiry for perhaps 40,000 tons is before the trade. A Chicago jobbing foundry is in the market for upward of 2000 tons for the first half, a radiator company has yet to place 6000 to 10,000 tons for this year, a furniture company is in the market for 1500 tons for the third quarter, a large agricultural implement maker has shown interest in the first half, and another, which is a large consumer, has made tentative inquiry for both the last half and next year. An important maker of charcoal iron quotes a minimum price of $38, furnace, or $39.75, delivered, Chicago, for grades 1 to 5 inclusive, and $40.50, furnace, for Scotch grades and No. 6 iron, all for this year. For 1918 delivery, this maker continues to receive inquiries, and sales are being made on the basis of $37, furnace, for grades 1 to 5, and $38.50, furnace, for Scotch and No. 6. At the same time, other makers quote $38.75 to $41.75, Chicago, covering the various grades. Lebanon low-phosphorus iron has been sold here at $75 to $80, furnace, taking freight of over $5 per ton. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 5	$38.75 to $39.75
Lake Superior charcoal, No. 6 and Scotch	40.50 to 41.75
Northern coke foundry, No. 1	39.50
Northern coke foundry, No. 2	39.00
Northern coke foundry, No. 3	38.50
Northern high-phosphorus foundry	38.00
Southern coke No. 1 f'dry and 1 soft	39.00
Southern coke No. 2 f'dry and 2 soft	38.00
Malleable Bessemer	39.00
Basic	39.00
Low phosphorus	72.50
Silvery, 8 per cent	47.50
Bessemer ferrosilicon, 10 per cent	57.50

Ferroalloys.—Ferromanganese is becoming more scarce, and many predictions are heard that prices will be higher. Future 80 per cent still can be had around $300, and spot at $325. For 150 tons of last half $300 was paid. The representative of one maker reports that $400 was offered for two cars of spot; and this interest quotes $350 for the fourth quarter. Some 8 to 9 per cent Bessemer ferrosilicon, first half delivery, has been placed at approximately $45, Chicago. A sale for export of 12 to 13 per cent brought $63.85, New York. Not much activity in Bessemer ferrosilicon can be reported.

Rails and Track Supplies.—In the past few days Western railroads have placed orders for rails aggregating 40,000 tons for delivery in the last half of 1918, but the mills which will supply the rails are averse to naming the roads. So far as track supplies are concerned the market has been quiet, with no business of a noteworthy character. Quotations are as follows: Standard railroad spikes, 3.70c. to 3.80c., base; small spikes, 4c., base; track bolts with square nuts, 4.60c. to 4.70c., all in carloads, Chicago; tie plates, $60 to $70, f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base; open-hearth, $40; light rails, 25 to 45 lb., $55; 16 to 20 lb., $56; 12 lb., $57; 8 lb., $58; angle bars, 2.75c., base.

Structural Material.—Although the fabricating shops are not busy, they are anxious to contract, along with the general trade. Mill quotations are unchanged at 3.789c., Chicago, delivery at mill convenience. One company continued to sell up to 4c., Pittsburgh, then withdrew, and now asserts it has nothing to sell. Structural lettings are a little more numerous this week, but none of them involve large figures. Six buildings for the Sinclair Refining Company at Argentine, Kan., requiring 196 tons, were awarded to the Kansas City Structural Steel Company; a Masonic Temple at Sacramento, Cal., requiring 500 tons, went to the Palm Iron Works; a factory building at Marquette, Mich., for the Piqua Handle & Mfg. Company, 105 tons, to the Duffin Iron Company; a coal-handling structure at Blue Island, Ill., for the Public Service Company, 242 tons, will be fabricated by the Rochester Bridge Company; a power station at Dixon, Ill., for the Illinois Northern Utilities Company, 173 tons, went to the Lakeside Bridge & Steel Company, and 154 tons of spans and beams for the Chicago Great Western Railroad will be supplied by the American Bridge Company. The Pullman Company received an order for 500 box cars from the Philadelphia & Reading.

We quote for Chicago delivery of structural steel out of jobbers' stocks, 4.50c.

Plates.—Of plates, the almost invariable story is "None to sell." The quotation of the leading interest,

4.50c., Pittsburgh, or 4.689c., Chicago, is, of course, nominal, inasmuch as it involves indefinite delivery. For shipment this quarter the actual price is around 6c. to 6.50c., Pittsburgh. An order for 1000 tons was proffered at 6.50c., Chicago, for delivery any time this year. Nevertheless, one mill can make shipments in 3 or 4 months, and probably would accept 6c. For the narrower widths, that is up to 72 in., quotations are unchanged at 5.189c. to 5.659c., Chicago. Jobbers have advanced their quotation $10 per ton.

We quote for Chicago delivery of plates out of jobbers' stocks, 6c.

Sheets.—The market continues its upward trend, with material more difficult than ever to obtain. An important mill is entirely out of the market on galvanized, and has but little to offer in blue annealed and black. No. 10 blue annealed, Chicago delivery, are quoted at 5.439c.; No. 28 box annealed, 5.939c.; and No. 28 galvanized, 7.25c., Pittsburgh, or 7.439c., Chicago. Jobbers have advanced their quotations.

We quote for Chicago delivery out of stock, regardless of quantity as follows: No. 10 blue annealed, 5.75c.; No. 28 black, 6.25c., and No. 28 galvanized, 8.25c.

Bars.—The nominal quotation for mild steel bars is 3.35c., Pittsburgh, or 3.539c., Chicago, with the actual price 3.55c. to 3.75c. High-carbon bars are strong at 3.25c., Chicago, but it is felt that they will soon advance, not only because of the growing demand, but because of the higher cost of rerolling rails. Iron bars are strong, around 3.25c., Chicago. At the higher quotation for mild steel bars, 3.75c., Pittsburgh, or 3.939c., Chicago, delivery can be secured in 3 or 4 months. Shafting, in carloads, is quoted 20 per cent off, and less than carloads at 15 per cent off.

We quote prices out of store for Chicago delivery as follows: Soft steel bars, 4.25c.; bar iron, 4c.; reinforcing bars, 4.25c., base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent.

Rivets and Bolts.—The expected advance in prices had not materialized in the early part of this week, but was impending. The demand is heavier, and the pressure for second-half contracts greater on all sides. The manufacturers intimate that they must advance their prices to meet the advancing costs of bars, wire rods, etc. Jobbers have advanced their quotations on structural and boiler rivets. Mill quotations are as follows: Carriage bolts up to ⅜ x 6 in., rolled thread, 40-10; cut thread, 40-2½; larger sizes, 30-5; machine bolts up to ⅜ x 4 in., rolled thread, with hot-pressed square nuts, 50; cut thread, 40-10; large size, 35-5; gimlet-point coach screws, 50; hot-pressed nuts, square, $2.50 off per 100 lb.; hexagon, $2.60 off. Structural rivets, ¾ to 1¼ in., 4.75c. to 4.939c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

Store prices are as follows: Structural rivets, 5c.; boiler rivets, 5.10c.; machine bolts up to ⅜ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅜ x 6 in., 40-2½; larger sizes, 30-5; hot-pressed nuts, square, $3, and hexagon $3 off per 100 lb.; lag screws, 50.

Wire Products.—Beyond a sustained heavy demand the market presents nothing which can be made the subject of comment. We quote to jobbers as follows, per 100 lb.: Plain fence wire, Nos. 6 to 9, base, $3.339; wire nails, $3.389; painted barb wire, $3.539; galvanized barb wire, $4.239; polished staples, $3.539; galvanized staples, $4.239, all Chicago, carload lots.

Cast-Iron Pipe.—Lettings have been almost nil in the past week. Hammond, Ind., awarded 400 tons to the American Cast Iron Pipe Company. On April 16 it is expected Winnipeg, Man., will award the contract for 5000 tons of water pipe, a proposition which has been up for some time. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $53.50; 6-in. and larger, $50.50, with $1 extra for class A water pipe and gas pipe.

Old Material—The market is advancing by leaps and bounds, and in every direction. The recent buying by the leading interest specified April shipment, indicating that its shortage is but temporary in character. Material is scarce. Melting steel is especially active, and higher levels for cast scrap are predicted in view of the wider demand. Several railroads issued lists in the week, but most of them offered small tonnages. The Wabash offered about 2000 tons, the Omaha 300 tons, the Panhandle 3000 tons, the Monon 200 tons, the Northern Pacific 700 tons, the Pere Marquette 500 tons, the Santa Fe 3000 tons, and the Chicago Great Western 300 tons. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$31.00 to $32.00
Relaying rails	39.00 to 40.00
Old carwheels	24.00 to 25.00
Old steel rails, rerolling	33.00 to 34.00
Old steel rails, less than 3 ft	30.00 to 31.50
Heavy melting steel scrap	27.00 to 27.50
Frogs, switches and guards, cut apart	27.00 to 27.50
Shoveling steel	25.00 to 25.50
Steel axle turnings	16.50 to 17.00

Per Net Ton

Iron angles and splice bars	$32.50 to $33.00
Iron arch bars and transoms	34.00 to 34.50
Steel angle bars	27.50 to 28.00
Iron car axles	39.00 to 40.00
Steel car axles	40.00 to 41.00
No. 1 railroad wrought	29.50 to 30.00
No. 2 railroad wrought	27.50 to 28.00
Cut forge	27.50 to 28.00
Pipes and flues	16.50 to 17.00
No. 1 busheling	19.00 to 19.50
No. 2 busheling	13.50 to 14.00
Steel knuckles and couplers	27.00 to 27.50
Steel springs	28.50 to 29.00
No. 1 boilers, cut to sheets and rings	17.50 to 18.00
Boiler punchings	24.00 to 24.50
Locomotive tires, smooth	38.00 to 38.50
Machine-shop turnings	10.00 to 10.50
Cast borings	10.25 to 10.75
No. 1 cast scrap	20.25 to 20.75
Stove plate and light cast scrap	14.00 to 14.50
Grate bars	14.50 to 15.00
Brake shoes	14.50 to 15.00
Railroad malleable	20.00 to 20.50
Agricultural malleable	18.00 to 18.50

Philadelphia

PHILADELPHIA, PA., April 10, 1917.

Evidences of great activity of the Government in preparing for war are manifested in many ways in this district. Strong pressure is being brought to bear for the delivery of materials to concerns manufacturing munitions. For example, a steel company which had sold forging billets received a letter from the Navy Department urging quicker delivery to the customer and it was immediately arranged to comply with the Government's request. A report having reached the Government that, as stated in THE IRON AGE last week, shipments of manganese ore from Cuba were being delayed owing to the recent revolutionary disturbances on the island, the State Department telephoned a Philadelphia firm for full particulars and it is probable that steps will be taken at once to insure the shipment of the ore. Keenest interest is being shown on the part of manufacturers in the Philadelphia district in the announcement that representatives of leading steel companies have made an agreement with Secretary Daniels to sell plates to the Government at 2.90c., Pittsburgh, and shapes and bars at 2.50c. The desire to cooperate in every reasonable way with the Government is expressed on all sides, but it is pointed out that, in order to avoid unjust discrimination against companies that are not thoroughly integrated, it will be necessary for the Government to make special arrangements with such companies and either allow them to charge a higher price for their finished products or insure them their raw materials at prices much below prevailing quotations. Some companies in this district are selling semi-finished material, shapes, plates and bars to concerns which are manufacturing for the Government and it is expected that these manufacturers will demand price concessions if they in turn are expected to sell to the Government at lower than the regular prices. Some of the smaller independent concerns are pointing out that the periods of prosperity during the past ten years have not been numerous and that it would be a hardship to require them to take on a large amount of Government business at the suggested prices. Doubtless there will be numerous controversies as to price adjustments, but it is believed that the prevailing spirit of patriotism will greatly assist in bringing about satisfactory conditions.

Pig Iron.—The market is extremely strong and prices continue to advance. No very large sales are reported,

but this is mainly due to the fact that nearly all furnaces have sold up almost the entire estimated production for the remainder of this year and are not encouraging business for next year. There is, however, steadily increasing interest in next year's market. Virginia iron for this year's delivery is very strong. One company, after making a sale of 1000 tons at $38, furnace, advanced to $40. A limited tonnage of Virginia No. 2 iron has been sold for the first half of next year at $34.50, furnace, an advance of 50c. over the highest price paid the preceding week. The strength of the Pennsylvania market is shown by the quick sale of several thousand tons of various grades of iron which a steel company had on hand. Some of this iron sold at $43, furnace, but it was unusually high in silica. No. 2X is strong at $41 to $42, furnace. Basic is quoted at $38 to $40. A sale of 200 tons of Tennessee iron was made on a basis of $34, Birmingham, for last half, silicon being 2 to 2½ per cent. Buffalo iron is being offered for sale at $42 for No. 2X for prompt delivery. A Lenoir City, Tenn., consumer is in the market for 2700 tons of various foundry grades for third-quarter delivery. The Government is inquiring for 300 tons of No. 1 foundry, 600 tons of No. 2, 800 tons of No. 3, 350 tons of charcoal and 350 tons of low-phosphorus, all for delivery within 30 days at Norfolk. The price of No. 2 plain Middlesboro, Ky., iron has been advanced from $33 to $34. Low-phosphorus iron continues strong and active at $70 to $75 for standard and $65 to $70 for copper bearing. Quotations for standard brands delivered in buyers' yards for prompt shipment range about as follows:

Eastern Pa. No. 2 X foundry	$41.00 to $42.00
Eastern Pa. No. 2 plain	40.50 to 41.50
Virginia No. 2 X foundry	38.75 to 40.75
Virginia No. 2 plain	38.25 to 40.25
Gray forge	37.75 to 38.75
Basic	38.00 to 40.00
Standard low-phosphorus	70.00 to 75.00

Ferroalloys.—Quotations are advancing rapidly, and with the entire absence of any English ferromanganese being offered, domestic makers are finding it very difficult to meet the demand. The minimum price now is 350 for either prompt or future delivery. Receipts from England the past week at Philadelphia port were 500 tons. The usual quotation on spiegeleisen is $75 for the last half, but it is understood that $60 can still be done for delivery the last quarter of the year.

Iron Ore and Manganese.—Owing to the extreme difficulty of obtaining vessels in which to ship manganese ore, at least one importer is considering the advisability of appealing to the British Government with the request that it supply necessary vessels, if possible. The action of Cuba in declaring war on Germany has been heard with much satisfaction by owners of ore mined in that country, for it is believed that with Cuba as an ally the movement of ore will be facilitated as much as possible, as it will be badly needed in the manufacture of steel for munitions. Iron-ore imports at Philadelphia port in the past week were from Sweden 6039 tons valued at $31,956, from Cuba 5000 tons valued at $25,000 and from Spain 2897 tons valued at $8,700.

Structural Material.—Mills in this district are oversold and frequently decline to quote, but when they do, the minimum quotation is 4c., Pittsburgh, although the Carnegie Steel Company's 3.60c., Pittsburgh, price has not been withdrawn. On the 13,000 tons for subway construction on which bids were received April 3 the Keystone Construction Company apparently is low bidder on two sections and the Philadelphia Subway Construction Company on one section, but no action has been taken in regard to awarding contracts, nor has anything been done in regard to the 7000 tons for subway work on which bids were received Feb. 6.

Plates.—Owing to the fact that mills are sold far ahead, as well as the disposition to reserve some capacity for Government needs, probably more inquiries were not quoted upon the past week than in any similar period in the many weeks of extremely heavy business. Among the tonnages which could not be booked were 18,000 tons of Lloyd's hull steel, 2000 tons of Lloyd's boiler steel, material for 250 locomotives for a foreign country and 6000 tons of hull steel for the Far West. The mills are now refusing to consider orders which even a week or ten days ago would have been booked. Leading independents have again advanced quotations $10 per ton and are quoting as follows, Philadelphia: Tank steel, 7.159c.; ship steel, 8.659c. to 10.159c.; ordinary flange, 7.309c.; ordinary fire-box, 7.359c.; Lloyd's flange, 10.159c.; Lloyd's fire-box, 10.209c.; marine steel, 16.159c. to 17.159c. In some cases ½c. per lb. higher than the above prices has been paid and Pittsburgh mills are reported to be asking even more in some instances than are Eastern mills.

Billets.—Semi-finished material is so scarce that it is almost impossible to buy it at any price. Quotations nominally continue at $70 for open-hearth heavy rerolling billets and $90 to $100 for forging billets.

Bars.—An advance in quotations on bar iron is probable in the near future. It is expected that the Government will be in the market for bar iron for chain, but what price will be quoted to it has not been decided. The present price is 3.50c., Pittsburgh, or 3.659c., Philadelphia. On steel bars the Carnegie Steel Company quotes 3.35c., Pittsburgh, but the prevailing quotation named by other makers is 3.75c., Pittsburgh, for fairly prompt delivery.

Sheets.—The prevailing quotation on No. 10 blue annealed sheets is still 5.75c., Pittsburgh, or 5.509c., Philadelphia, with the demand active and supply limited.

Coke.—The car situation continues to show some improvement and prices of coke are easier. On prompt furnace coke, $7.75 per net ton at oven has been done on a small tonnage. On foundry coke, $8.50 is the usual quotation for future delivery, while $10 to $11 is asked for prompt.

Old Material.—The reported buying of 50,000 tons of heavy melting steel in the Pittsburgh district by the Carnegie Steel Company and of large tonnages by other companies in that district, resulting in an advance to $30, has had a stimulating effect on the Eastern market. Steel of this grade is being shipped from New England and other Eastern points to Pittsburgh. Naturally, prices have advanced, but the quotations on heavy melting steel have not been moved up more than $1 per ton. Low-phosphorus and several other grades have also been marked up about $1. The market is strong, but there is some hesitation manifested, as it is realized that prices are very high and that any untoward influence might cause a sudden and decided slump. Quotations covering eastern Pennsylvania, and taking freight rates from 35c. to $1.35 per gross ton, are as follows:

No. 1 heavy melting steel	$25.00 to $26.00
Old steel rails, rerolling	32.50 to 33.00
Low-phosphorus heavy melting steel scrap	37.00 to 38.00
Old iron and steel axles (for export)	47.00 to 48.00
Old iron rails	31.00 to 32.00
Old carwheels	25.00 to 26.00
No. 1 railroad wrought	35.00 to 36.00
Wrought-iron pipe	21.00 to 22.00
No. 1 forge fire	18.00 to 18.50
Bundled sheets	18.00 to 18.50
No. 2 busheling	15.00 to 16.00
Machine-shop turnings	15.00 to 16.00
Cast borings	15.50 to 16.50
No. 1 cast	26.50 to 27.50
Grate bars, railroad	18.00 to 19.00
Stove plate	18.00 to 19.00
Railroad malleable	19.00 to 20.00

Buffalo

BUFFALO, N. Y., April 10, 1917.

Pig Iron.—While buying is not heavy, prices are absolutely firm, with indications of frequent and rapid advances on the part of producers. For various periods of delivery over 1917 the present range of prices is $40 to $45 f.o.b. cars at furnace. One furnace interest announces that $45 is now its minimum for any grade of iron. For shipment during the first quarter and first half of 1918 the minimum price now appears to be $40 at furnace, although some sales have been made in the past week at somewhat less than that figure. The general average of authoritative opinion seems to be pointing to $40 as representing the selling price for all grades for the current week. Blast fur-

naces are following an inactive or restricted offering policy in quoting for any period of shipment, and sales made have been almost wholly through the consumer wanting to purchase. We quote as follows for delivery over the remainder of the year, f.o.b. Buffalo:

High silicon irons	$45.00
No. 1 foundry	$42.00 to 45.00
No. 2 X foundry	41.00 to 45.00
No. 2 plain	40.00 to 45.00
No. 3 foundry	40.00
Gray forge	40.00
Malleable	45.00
Basic	45.00
Charcoal	42.00

Finished Iron and Steel.—There is considerable inquiry in the market, and some selling has been done during the week at 3.50c., Pittsburgh, base for bars, 3.75c. for structural shapes, and 5c. to 5.50c. for grooved rolled plates. The leading interest, however, is still quoting 3.35c. for bars, 3.60c. for structural shapes, 4.50c. for plates, and 4.50c. for hoops. For sheared plates for shipbuilding purposes, 7.50c. base is asked, and 4c. to 5c. for structural shapes for shipbuilding in accordance with British standards. Some independent jobbers are asking 7c. from warehouse stock for plates; the warehouse range of prices being 6.50c. to 7.50c., the latter being for plates over 78 in. wide. Bars are held at 4.40c., and structural shapes at 4.60c. from warehouse. It is stated that the independent tin plate manufacturers decline to adjust their contracts on the basis announced by the leading interest, and that some adjustments have been made on an $8 per box basis, and that price apparently is the minimum. It is reported that as high as $9 per base box has been obtained. Mills are showing considerable reluctance to entertain business at to-day's prices, being convinced that with the rapidly increasing costs prices for all commodities will have to advance to a higher level. Bids go in to-day on State Barge Canal Contract No. 138 for the Genesee River dam at Rochester, requiring about 750 tons of structural steel and 65 tons of gate-house and operating machinery. The Eastern Concrete Steel Company, Buffalo, will build the substructure for Louisiana Street viaduct over Erie Railroad tracks, Buffalo, taking 300 tons of reinforcing steel; and the Peckham Construction Company, Buffalo, will erect the 800-ton superstructure to be fabricated by the American Bridge Company. The Lackawanna Bridge Company, Buffalo, has taken 2000 to 3000 tons for the Erie Forge Company, Erie, Pa.

Old Material.—Heavy sales of heavy melting steel were made in the past week, on the basis of $27.50 to $28, f.o.b. Buffalo. A part was for shipment to the Pittsburgh district. The local demand for this commodity also continues strong, and the entire list is extremely active, with ascending prices in sympathy with the rising scale in pig iron and finished steel. The marked scarcity in heavy melting steel is forcing a demand for other grades, particularly turnings, both machine shop and heavy axle turnings, and prices now being paid for these two commodities are regarded as out of proportion to heavy melting steel prices. We quote dealers asking prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$27.50 to $28.00
Low phosphorus	35.00 to 36.00
No. 1 railroad wrought	33.00 to 34.00
No. 1 railroad and machinery cast	24.00 to 24.50
Iron axles	45.00
Steel axles	45.00
Carwheels	25.50 to 26.00
Railroad malleable	25.00 to 25.50
Machine shop turnings	13.00 to 13.50
Heavy axle turnings	18.50 to 19.00
Clean cast borings	13.00 to 13.50
Iron rails	27.00 to 27.50
Locomotive grate bars	16.50 to 17.00
Stove plate	16.50 to 17.00
Wrought pipe	17.00 to 17.50
No. 1 busheling scrap	22.00 to 22.50
No. 2 busheling scrap	14.00 to 14.50
Bundled sheet scrap	16.00 to 16.50

Spanish imports of pig iron and tin plates are reported as large in 1916. The pig-iron imports were 30,448 tons against only 8146 tons in 1915. The tin-plate imports were 11,087 tons last year against only 1486 tons in 1915.

Cincinnati

CINCINNATI, OHIO, April 10, 1917. (*By Wire.*)

Pig Iron.—A leading sanitary manufacturing company bought last week 5000 tons of Southern iron for shipment to its different plants, and a small part of this tonnage was for delivery in May and June. A Michigan melter purchased 3500 tons of Southern foundry for last-half shipment. Other sales were confined to smaller lots, mostly for last half, although there is some buying for the first half of 1918. Southern iron is daily becoming scarcer, and there is little to be obtained for second and third-quarter movement. As a consequence, prices have been forced higher, and $35, Birmingham basis, is now considered minimum for any shipment this year, although a few sales were made last week below this figure. In a few cases as high as $37 has been obtained for some prompt iron. Northern No. 2 foundry is quoted to-day at $38, Ironton, but this is only a nominal figure, as very little iron in that district is available for shipment this year, with the exception of some small lots of the lower grades. Virginia No. 2X is still quoted at $34, furnace, for the first half of next year, and at $38 for this year's shipment. But it is understood that the leading producer in that district has order books so well filled that no further business is solicited. The correct average for Ohio silvery irons is difficult to obtain. Some 8 per cent silicon iron was sold last week in Michigan as low as $42, at furnace, while to-day's quotations range from $45 to $50. Lake Superior charcoal iron is showing more life, and one sale of 3000 tons was made in Michigan for last-half shipment. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft	$38.40 to $38.90
Southern coke, No. 2 f'dry and 2 soft	37.90 to 38.40
Southern coke, No. 3 foundry	37.40 to 37.90
Southern coke, No. 4 foundry	36.90 to 37.40
Southern gray forge	31.90 to 32.40
Ohio silvery, 8 per cent silicon	47.26 to 48.26
Southern Ohio coke, No. 1	39.76
Southern Ohio coke, No. 2	39.26
Southern Ohio coke, No. 3	38.76
Southern Ohio malleable Bessemer	38.26
Basic, Northern	38.26
Lake Superior charcoal	39.20
Standard Southern carwheel	34.40

(*By Mail*)

Coke.—Some foundry coke has been sold in small lots for shipment within the next two months, but these purchases are understood to be mainly to guard against delayed shipments on old contracts. Yard supplies are not as plentiful as most foundrymen would desire. Quotations on prompt 72-hr. coke in the Connellsville, Wise County and New River districts range from $10.50 to $12.50 per net ton at oven, with contract prices averaging from $8 to $9. Pocahontas coke for nearby shipment is scarcer than that from other fields. Furnace coke is not in demand, although a limited tonnage has been sold lately for domestic use. Contract figures are from $7 to $8 per net ton at oven.

Finished Material.—Both mill and jobbers' prices have been advanced on almost everything. The nearby mills are quoting to-day No. 28 galvanized sheets on a basis of 8.65c. f.o.b. Cincinnati, or Newport, Ky., and 6.15c. on No. 28 black sheets The differential in price now observed between No 28 galvanized sheets and No. 29 is 25c. per 100 lb. advance for the latter, and an advance of 50c. on No. 30. Warehouse prices continue to climb, but in spite of this there is a good demand, especially for plates, shapes and reinforcing concrete rods. The store price of plates is 6c.; structural shapes, 4.60c.; steel bars, 4.40c.; twisted bars, 4.55c.; No. 10 blue annealed sheets, 5.75c.; machine bolts, ⅜ x 4 in. and smaller, 50 per cent discount; larger and longer, 30 and 10 per cent discount; set screws, 45 per cent discount; files, 50 and 10 per cent discount and hack saws, 10 per cent discount. It is currently reported that an early advance on hack saws is scheduled, making the price at the full list quotation. Wire nails are unchanged at $3.60 per keg base and barb wire 4.40c. to 4.50c. per lb. There is yet considerable delay in making many shipments to out of town customers.

Old Material.—Nearly all kinds of cast scrap is in good demand, and prices have advanced. Heavy melting steel scrap is quoted to-day around $23 per gross ton, and railroad cast is nearly $2 per ton higher. There is no demand for cast borings or steel turnings, and as a consequence quotations on both are close to $6.50 per net ton. The following are dealers' prices f.o.b. at yards, southern Ohio and Cincinnati:

	Per Gross Ton	
Bundled sheet scrap	$16.00 to	$17.00
Old iron rails	26.00 to	26.50
Relaying rails, 50 lb. and up	29.00 to	29.50
Rerolling steel rails	27.00 to	28.00
Heavy melting steel scrap	23.00 to	24.00
Steel rails for melting	21.50 to	22.00
	Per Net Ton	
No. 1 railroad wrought	$24.00 to	$25.00
Cast borings	6.50 to	7.00
Steel turnings	6.50 to	7.00
Railroad cast	19.00 to	20.00
No. 1 machinery cast	20.00 to	21.00
Burnt scrap	11.00 to	11.50
Iron axles	33.50 to	34.00
Locomotive tires (smooth inside)	33.00 to	34.00
Pipes and flues	14.00 to	15.00
Malleable cast	16.00 to	16.50
Railroad tank and sheet	14.00 to	15.00

Birmingham

BIRMINGHAM, ALA., April 9, 1917.

Pig Iron.—With makers reluctant to book far ahead the comparatively small remaining furnace capacity of this year, the market continues to harden. A sale of 2500 tons for last-half delivery at $32 was one of the leading transactions of the early part of the first week in April. By Friday, however, the same seller had booked a round lot for the second half at $34, and after quoting $35 on an inquiry, declined to make further quotations. The leading foundry-iron maker, restricting business to regular customers in need of immediate supplies, made sales of small lots at $35. It is sold almost to capacity for the remainder of 1917, and is offering 100,000 tons of 1918 iron at $35. The Tennessee Company announced no change, which is to say that its price for all delivery, including 1918, is $32. This is the lowest price named, with the exception that one other maker asks $32 for the first quarter of 1918 for regular foundry, and $35 for special iron, having sold 10,000 tons of these two grades for 1918 delivery and is entirely out of the market for the rest of 1917. Carload lots, sold through brokers, have brought as high as $36. Charcoal iron has advanced to $36.50 and $37.50, with those prices obtained on actual transactions. The leading interest is among those which have sold into 1918 in a small way. Most makers have not opened for 1918 as yet. Supreme effort is bent on delivery. This is improving under the lifting of several embargoes. The early stages of the war have been without feature around industrial plants, with the exception of establishing a stricter guard. The negro exodus to the North in response to the high wage call has not curtailed the supply of common labor, but it has forced the introduction of raw hands from rural districts to take the place of experienced workmen. One furnace operator says all his common negro labor is this raw material, the North having claimed the entire old force. The exodus continues and the work of instructing raw hands grows. "The money in it" is the inducement, both in case of the experienced negro who goes North and the rural negro who has left the abandoned cotton fields for cities and industrial plants. The iron output made a new record in March, and will assume greater proportions in another month. We quote, per gross ton, f.o.b. Birmingham district yards, as follows:

No. 1 foundry and soft	$32.50 to $35.50
No. 2 foundry and soft	32.00 to 35.00
No. 3 foundry	31.50 to 34.50
No. 4 foundry	31.25 to 34.25
Gray forge	31.00 to 34.00
Basic	32.00 to 35.00
Charcoal	36.50 to 37.50

Cast-Iron Pipe.—In spite of the further advances in pipe, the fill-in and immediate necessity orders, combined with large contracts not yet completed, keep plants going to approximate capacity. We quote, per net ton, f.o.b. pipe shop yards, as follows: 4-in., $48; 6-in. and upward, $45, with $1 added for gas pipe and special lengths.

Coal and Coke.—Little is being done in the foundry coke market, because the makers are well supplied with contract orders calling for the output. Not much spot is squeezed out for immediate inquiry. Regular customers running short have been supplied at $12.50 per net ton at oven, which is the minimum. For others the quotation is around $15, at which some sales have been made. Furnace coke is $5 to $6.50, f.o.b. oven. Coal mines are rushed to capacity to meet the demand. Steam coal is bringing $2.50 to $3 at the mines, which is 100 per cent over former prices. Many new collieries are opening up in Walker County.

Old Material.—The scrap market displays considerable activity. The high price of pig iron has caused a rush on all material available as substitutes in foundry practice, pipe works being among the active purchasers. Rails, wrought, heavy melting steel, carwheels, in fact almost the entire line, advanced another $1 in the past week. The supply is constantly replenished, owing to new construction and machinery taking the place of old. We quote, per gross ton, f.o.b. Birmingham yards, as follows:

Old steel axles	$35.00 to $40.00
Old steel rails	20.00 to 21.00
No. 1 wrought	22.00 to 23.00
No. 1 heavy melting steel	18.50 to 19.50
No. 1 machinery cast	19.00 to 20.00
Carwheels	17.00 to 18.00
Tramcar wheels	15.50 to 16.00
Stove plate and light	14.00 to 14.50
Turnings	8.75 to 9.25

Bars.—Steel bars, in car loads, f.o.b. Birmingham, are quoted at 3.50c. to 3.75c.; iron bars, 3.30c. to 3.50c.

New York

NEW YORK, April 11, 1917.

Pig Iron.—While the volume of business the past week has not been large, there has been very fair activity and the market is strong, with numerous sales made at higher prices than a week ago. A number of inquiries have been received from foreign countries, including one from France for nearly 50,000 tons of No. 3 foundry, 2000 tons of Bessemer for Norway and 3300 tons of various foundry grades for delivery at the American Locomotive Company's plant at Montreal during the next six months. There is great variation in the price of Buffalo iron. One leading seller is asking $45 for No. 2 X for this year, but others are quoting $3 lower, while for the first half of next year $36 apparently is the lowest quotation available. An inquiry for 6000 tons of special analysis iron for fourth-quarter delivery has been received from a New England customer. Other inquiries include 1000 tons of foundry for first half from New England, 1000 tons of No. 2 plain and 1000 tons of No. 2 X from a New Jersey melter for next year and 1000 tons from the Metropolitan district for next year from a melter who has just bought a like amount. A Virginia furnace, after making sales at $38, furnace, has advanced to $40 for this year's delivery. Eastern Pennsylvania No. 2 X iron is selling at $41 to $42, tidewater. Basic iron is strong and is usually quoted $1 higher, but is not very active. We quote at tidewater for early delivery as follows:

No. 1 foundry	$42.00 to $43.00
No. 2 X	41.00 to 42.00
No. 2 plain	40.00 to 41.00
Southern No. 1 foundry	39.00 to 40.00
Southern No. 2 foundry and soft	38.00 to 39.00

Ferroalloys.—At least 10,000 tons of spiegeleisen, 20 per cent, has been sold or is under negotiation. Some of this is to be delivered within the next four months and the price is understood to be $75, furnace. The bulk of the remainder is for delivery during this year, although inquiries for consumption in 1918 are also under consideration. For next year's delivery the quotation is about $60, furnace, while $70 to $75 is generally asked for any delivery this year. Sales of a few carloads of domestic ferromanganese have been made at $350 for early delivery and this is generally regarded as the quotation. Material for delivery during the remainder of the year is generally held at $300 to $350. Only a little British alloy is available for 1917 delivery. Some inquiries have appeared for 1918 delivery, but no contracts are reported made. The market in general is quiet but very strong. Receipts

from England are reported as fairly good. Production in the United States in March, according to THE IRON AGE's blast-furnace reports, was about 18,500 tons, or 1500 tons under the average for the previous five months. It is stated that both Indian and Brazilian manganese ore is being delivered at the seaboard in this country at from $1 to $1.10 per unit, which are record prices. Ferrosilicon, 50 per cent, is active and in strong demand, with sales for most any delivery this year being made at $250, delivered.

Finished Iron and Steel.—The closing of business seems for the time being to be held up awaiting definite information of the Government program both in finance and in war purchases. Broadly, opinions about the forward movements are in the making. When it comes to the special prices to the Government, given as 2.50c. for bars and shapes and 2.90c. for plates, the effect on the market is not yet measured, partly because of the indefiniteness of the totals involved and because of the unknown distribution to be made among the mills. With a pro rata distribution, it is not believed that the total will seriously disturb mill operations or selling plans, but an open question is the possibility of further buying by or for the allied governments at concessions more or less comparable to those accorded the United States Government. Opinion on the whole is that prices have still an upward tendency. It is indicated in the naming now by one mill, of 10c. per lb. on ship plates and in the withdrawal by another mill of its prices on plates; it is indicated in a prophecy by a bar-iron producer that 5c. per lb. will sooner or later be reached and by a prediction of a large structural mill that shapes will go considerably beyond present levels. Behind all is a tremendous export demand, much of which would remain even in the event of an early cessation of hostilities, if for no other reason than that financing of the projects would depend largely on American money. A fact freely commented on is the noteworthy volume of structural material continuing to come up for figures in spite of high prices. The speculative building is of course not a factor, but the structural work is largely for plant expansion and municipal developments, as noted a number of times in this column, with lately a notable number of power house extensions, indicating the increasing demand for power resulting from the enlarged industrial operations. For plain material, obtainable in three to four months, 4c. seems to be the minimum with 4.50c. to 4.75c. for small lots in somewhat earlier delivery. No considerable amount of fresh buying is noted as a means for establishing definitely steel bar and plate prices, but it seems clear that 3.75c., Pittsburgh, is minimum for steel bars in a few months and 6c., Pittsburgh, for either universal or tank quality plates. Bar iron is fairly strong at 3.50c., Pittsburgh, with bookings running through the summer. Some of the new structural projects which may be noted are the following: Office building at 35 Broadway for Gaston, Williams & Wigmore, Inc., 1500 tons; public library, Philadelphia, for which George A. Fuller Company has general contract, 2400 tons; sugar mill, Cuba, for the Hershey Mfg. Company, 1200 tons; theater, Philadelphia, 1100 tons; steel shed at Halifax, N. S., for the Harbor Commission, 3000 tons; piershed at Quebec, 1500 tons; an office building at 130 William Street, 900 tons, and a factory for Runkel Brothers, Inc., New York, 1500 tons. The power house projects mentioned include 600 tons for the Boston Edison company, 500 tons for the General Electric at Schenectady, 200 tons at Westport, Md., 300 tons at New Bedford, Mass., and 275 tons at Scranton, Pa. The contracts awarded include the following: West Side telephone building, 1000 tons, and the Newtown telephone building, Elmhurst, L. I., 400 tons, to Eidlitz & Ross; apartment at 2 West Sixty-seventh Street, 900 tons, to Milliken Brothers Inc.; two Interborough stations, New York, 900 tons, to the Bethlehem Steel Bridge Corporation; Norwegian State Railways, 1500 tons, to the United States Steel Products Company, and Boston Elevated Railroad, 750 tons, to Lewis F. Shoemaker & Co. We quote plain material from mill at 4.169c. to 4.919c., New York, the lower price in three to four months and the higher for small lots in earlier deliveries. We quote mill shipments of universal and tank plates at 6.169c. to 6.669c., New York, in a few months and ship plates at about 8.169c., New York, a lot of 500 tons at this price, for shipment in the last quarter of this year, being one of the late sales to be noted. We quote steel bars at 3.919c., New York, and iron bars at 3.669c., New York. From New York district warehouses we quote structural material at 4.50c.; iron bars at 4c.; steel bars at 4.35c., and steel plates at 6.50c.

Cast-Iron Pipe.—Bayonne, N. J., opened bids yesterday on about 500 tons of 8 to 20 in. No other public lettings of importance are announced. Quite a number of municipalities in New England are getting bids on small quantities and the demand from private buyers continues excellent. Prices are firm, with carload lots of 6-in., class B and heavier, quoted at $50.50 per net ton, tidewater, class A and gas pipe taking the usual extra of $1 per ton.

Old Material.—Heavy melting steel scrap is in active demand. Some brokers are offering as high as $25, New York, for strictly No. 1 heavy melting steel scrap for shipment to the West. While steel scrap is being sent from eastern Pennsylvania to Pittsburgh, to take advantage of the higher Western prices, some New York dealers still prefer to ship to eastern Pennsylvania even at the much lower prices obtainable there. Some classes of wrought scrap are scarce and much higher, especially No. 1 railroad wrought, sales of which in quite considerable quantities have been made at $40, delivered, in eastern Pennsylvania. Borings and turnings are weaker, owing to the withdrawal from the market of large eastern Pennsylvania consumers. Brokers quote buying prices as follows to local dealers and producers, per gross ton, New York:

Heavy melting steel scrap (for shipment West)	$24.50 to $25.00
Heavy melting steel scrap (for shipment to eastern Pennsylvania)	22.00 to 23.00
Relaying rails	41.00 to 42.00
Rerolling rails	31.00 to 32.00
Iron and steel car axles	45.00 to 46.00
No. 1 railroad wrought	36.00 to 37.00
Wrought-iron track scrap	30.00 to 31.00
No. 1 yard wrought, long	30.00 to 31.00
Light iron	8.50 to 9.00
Cast borings (clean)	12.50 to 13.00
Machine shop turnings	11.50 to 12.00
Mixed borings and turnings	11.50 to 12.00
Wrought-iron pipe (not galvanized or enameled)	19.50 to 20.00

Brokers are asking higher prices on machinery cast scrap delivered at points outside of New York City and its immediate vicinity. Numerous sales are reported at $30 delivered, equal to $28.25 to $28.50, New York. Dealers in New York City and Brooklyn are not able to secure these prices from local foundries and report that sales are being made to such consumers at the following rates:

No. 1 machinery cast	$23.00 to $24.00
No. 1 heavy cast (columns, building material, etc.)	22.00 to 23.00
No. 2 cast (radiators, cast boilers, etc.)	19.00 to 20.00
Stove plate	16.00 to 17.00
Locomotive grate bars	16.00 to 17.00
Old carwheels	27.00 to 28.00
Malleable cast (railroad)	22.50 to 23.00

British Pig-Iron and Steel Output in 1916

LONDON, ENGLAND, April 11, 1917. (*By Cable.*)—The pig-iron output of the United Kingdom for 1916 was 9,047,983 gross tons, of which 4,042,014 tons was hematite iron, 2,290,549 tons basic iron and 1,418,824 tons foundry iron. The steel output was 9,244,457 tons, including 1,196,153 tons of acid Bessemer steel, 505,817 tons of basic Bessemer, 4,393,004 tons of acid open hearth and 3,012,558 tons of basic open hearth. (The 1915 pig-iron output was 8,793,659 tons and the steel production, 8,350,944 tons.)

Rebuilding Vesta Furnace

E. J. Lavino & Co., Philadelphia, who acquired, some weeks ago, Vesta blast furnace at Watts, Pa., have torn down the shell and will put up a new shell and provide filling equipment. The company also acquired Aurora furnace at Wrightsville, Pa., which has been dismantled, its stoves being moved to the Vesta furnace. Both furnaces were formerly the property of the Susquehanna Iron Company.

British Steel Market

Pig Iron Firmer and Higher—Ferromanganese Sold at $210

LONDON, ENGLAND, April 11, 1917.—(*By Cable*).

The pig-iron market is firmer with Cleveland iron reported advanced 5s. per ton to 92s. 6d. to home consumers, subject to official confirmation. Tin plates are firmer at 27s. 6d. American semi-finished steel is nominal. Ferromanganese is firm, $210 c.i.f. having been paid for forward shipment to north Atlantic ports. We quote as follows:

Tin plates coke 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 27s. 6d., against 27s. 3d. last week.
Ferromanganese, £37 nominal.
Ferrosilicon, 50 per cent, c.i.f. £35 upward.

American Steel Hard to Obtain—Ferromanganese Makers Well Booked—Tin Plate Firmer

(*By Mail.*)

LONDON, ENGLAND, March 27, 1917.—The market is dominated by national requirements and there is no likelihood of any relaxation, while the forcing of productive capacity is hindered by shortcomings in the supply of labor. The long spell of severe weather has involved some dislocation, but operations are now proceeding more satisfactorily.

Pig iron continues very firm, current output being easily absorbed, although there seems to be plenty of material available to meet additional urgent needs. The demand for Cleveland foundry grades, however, is just now more subdued. There is no new feature regarding export business. New licenses are being issued sparingly. There is a big demand for Italy, but some doubt whether it can be covered fully at present. The output of East Coast hematite is being reduced a little, but additional furnaces have been put on Cleveland and basic irons. There are now 77 furnaces in blast in the north of England as against 75 a month ago. Maximum prices are unaltered, although there is some talk of a possible revision soon.

In finished iron and steel export business remains restricted and is practically confined to material that can be spared for the Allies, while inquiries from the colonies for various classes of steel, including wire, are in most cases turned down owing to lack of raw material. Prices still tend upward where the business done does not come within the scope of the price regulations.

The difficulty in obtaining American crude steel is greater than ever, due to tonnage shortcomings, and there is an almost entire absence of offers even for forward shipment. It is now hardly possible to obtain a quotation for billets. Wire rods are quite nominal at about £29 to £30, c.i.f., Liverpool.

Ferroalloys are very firm, but quotations are practically nominal, with ferromanganese ranging from about £36 to £38 for loose, f.o.b., for export, British makers being booked pretty fully for the second quarter. There is hardly anything obtainable even from second hands to satisfy the fairly numerous inquiries on Continental account.

There is a somewhat firmer feeling in the tin-plate trade, chiefly owing to the further large orders placed recently for essential work, the greater portion of which was booked at 26s. 9d., f.o.b. basis, 20 by 14, for shipment to Italy in the next two months. Works are now well sold and, with costs of production stiffening, there is more reticence in booking orders even on the basis of 27s. There is some difficulty in keeping production going, even at the present reduced rate, because of the steel position. There was a further reduction in the number of the mills operating during February.

An installation of the Holbeck system of preparing and distributing powdered coal for combustion purposes is to be made in connection with 120 furnaces of different sizes and kinds in the plant of Hubbard & Co., Pittsburgh.

Cleveland

CLEVELAND, OHIO, April 10, 1917.

Iron Ore.—The efforts that are being made to cut down materially dock stocks before the opening of navigation are indicated in the March shipments from Lake Erie docks, which aggregated 1,658,586 gross tons, as compared with 680,759 tons in February and 1,347,130 tons in March, 1916. Shipments were rather light during the winter, the curtailment being to some extent due to the railroad situation. We quote as follows, delivered lower Lake ports: Old range Bessemer, $5.95; Mesaba Bessemer, $5.70; old range non-Bessemer, $5.20; Mesaba non-Bessemer, $5.05.

Pig Iron.—Foundry iron continues in active demand both for the last half of this year and the first half of next, and there is an increased call for iron for early shipment. The market is very firm and the price tendency is still upward. While foundry iron for the first half of 1918 has been selling during the past few weeks at $3 to $4 lower than for the last half, the tendency of producers is to raise first-half prices to equalize them with last-half quotations. One Cleveland interest has marked up its first-half price in the valley to $39, the same as for the last half, and has made first-half sales at the advance. Cleveland-made iron is quoted at $40 for early shipment, and the producer is asking the same price for any future delivery. Another Cleveland interest is offering Valley foundry iron at $40 to $42 for early shipment, and has sold small lots at $41. Another Lake furnace is taking first-half orders in foundry and malleable iron at $38. The United Alloy Steel Corporation, Canton, Ohio, has bought 5000 tons of basic iron for the third quarter, and is in the market for 4000 to 5000 tons additional. Producers are now asking $38 and $39 for basic. The sale of 10,000 tons of basic is reported for export to Canada. We note the sale of 2000 tons of malleable iron for the last half at $40, and 1000 tons for the first quarter at $38. A Cleveland foundry has purchased 3000 tons of malleable iron for the first half. Many last-half sales of foundry iron in lots up to 1000 tons are reported at $40. Southern iron is fairly active and firm, being quoted at $35, Birmingham, for No. 2 for delivery this year, and $32 to $33 for next year, several sales being reported at the latter price. We note the sale of 1000 tons in the Pittsburgh territory for the second quarter of this year on the basis of $35. A Cleveland stove foundry has taken 2500 tons for the last half, and another Cleveland consumer 1500 tons for the first half. A leading stove interest has purchased 1000 tons of Southern and 500 tons of silvery for the first half, the silvery being sold at $45, for 8 per cent silicon. For prompt shipment, silvery is quoted at $50. We note the sale of a car lot of 12 per cent Bessemer ferrosilicon at $65. We quote, delivered Cleveland, as follows:

Bessemer	$40.95
Basic, nominally	$35.95 to 38.95
Northern No. 2 foundry	39.30 to 41.95
Southern No. 2 foundry	36.00 to 39.00
Gray forge	35.95
Ohio silvery, 8 per cent silicon	46.62
Standard low phos., Valley furnace	75.00

Finished Iron and Steel.—The declaration of war has had some stimulating effect upon the steel market in bringing out new inquiries for future shipment. Consumers feel that the heavy Government requirements that will result from the preparations for war will cause a greater congestion of the mills, and they are placing additional orders for future requirements. Some inquiry for steel for next year's delivery, particularly for billets, is coming out. There is an active demand from the railroads for frogs and crossings.

Old Material.—The local market has been excited during the past few days, and sharp price advances have been made on most grades following the reported heavy buying by the Carnegie Steel Company in Pittsburgh. Dealers have rushed to cover on short sales, and the rapid advances have caused some of them to suffer losses. Sales of heavy melting steel scrap for shipment to Youngstown and Canton are reported at $27.50 to $29. Cast scrap offered by the New York

Central Railroad is reported to have brought $27.50 per gross ton. In view of present market conditions dealers are unwilling to sell more than very limited quantities at present prices. Two steel companies in Cleveland are in the market for heavy melting steel. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton

Steel rails	$24.00 to $25.00
Steel rails, rerolling	34.00 to 35.00
Steel rails under 3 ft	31.00 to 32.00
Iron rails	31.00 to 32.00
Steel car axles	45.00 to 47.00
Heavy melting steel	27.50 to 28.00
Carwheels	23.50 to 24.00
Relaying rails, 50 lb. and over	37.00 to 38.00
Agricultural malleable	18.25 to 18.50
Railroad malleable	24.00 to 25.00
Light bundled sheet scrap	17.00 to 17.75

Per Net Ton

Iron car axles	$46.00 to $47.00
Cast borings	11.75 to 12.00
Iron and steel turnings and drillings	10.75 to 11.00
No. 1 busheling	20.50 to 21.00
No. 1 railroad wrought	31.00 to 32.00
No. 1 cast	21.50 to 21.75
Railroad grate bars	16.00 to 17.00
Stove plate	14.25 to 14.50

Judicial Decisions

ABSTRACTED BY A. L. H. STREET

ACCIDENTS IN HANDLING HEAVY OBJECTS.—It is actionable negligence toward employees engaged in moving such heavy objects as an iron tank for an employer to furnish a palpably insufficient set of skids for the purpose, and there is liability for injury resulting from breaking of such skids. A workman engaged in assisting in the installation of a water tank on a roof was not engaged in work covered by the New York workmen's compensation act, and hence his estate is entitled to recover in an ordinary suit damages resulting from his death attributable to negligence of his employer. (New York Supreme Court, Appellate Division, Maloney vs. Levy & Gilliland Company, 163 New York Supplement, 505.)

INJURY TO FOUNDRY EMPLOYEE.—A foundry employee having based a suit against his employer for injury, claimed to have been caused by an explosion of molten metal on contact with water, on the sole theory that the employer was negligent in permitting an accumulation of water under the foundry cupola, he could not recover on a theory that the evidence at the trial tended to show that the employer was negligent in another respect—in failing to warn plaintiff to leave the building before the cupola was dumped. (Illinois Supreme Court, Ozech vs. International Harvester Company, 115 Northeastern Reporter, 178.)

EMPLOYMENT OF MINORS IN ORE MINES IN ALABAMA.—In reversing judgment in favor of a boy employee who was injured in an Alabama mine, the State Supreme Court holds that the Alabama statute which prohibits the employment of boys under 14 years of age in any "mine" applies only to underground and not to open or surface mines. (Bearden vs. Sloss-Sheffield Steel & Iron Company, 74 Southern Reporter, 230.)

DICTATED BUSINESS LETTER AS LIBEL.—The dictation of a letter to a stenographer employed in a business establishment to be sent to a customer is not such publication of the contents of the letter to a third person as constitutes libel on account of any defamatory matter contained in the letter. "It is inconceivable how the business of the country, under the present conditions, can be carried on, if a business man or corporation may be subject to litigation for every letter containing some statement too strong, where it is only sent to the person to whom directed, and only heard by a stenographer to whom the letter is dictated. If the stenographer should, in violation of his or her duties, disclose such statement, there might be a liability because of the negligence of the person in employing an improper person as stenographer." (Mississippi Supreme Court, Fischel & Kaufman vs. Cartwright-Caps Company, 74 Southern Reporter, 278.)

RIGHT TO ENJOIN PICKETING.—An employer is not entitled to enjoin striking employees from maintaining pickets in streets leading to his plant, for the purpose of ascertaining what men are continuing at work or seeking employment and of urging such persons not to work at the plant. The strikers are not entitled, however, to use coercive or other unlawful methods to interfere with the operation of the plant. But the adoption of unlawful means will not entitle the employer to enjoin all picketing, including lawful, as well as unlawful, conduct. (United States Circuit Court of Appeals, Seventh Circuit, Tri-City Central Trades Council vs. American Steel Foundries, 238 Federal Reporter, 728.)

Iron and Industrial Stocks

NEW YORK, April 11, 1917.

From the declaration of war against Germany the stock market has been weakening. The decline has not been precipitous, but each day seems to mark a slightly lower price than the one preceding. This recession in values was at first attributed to German interests in this country selling their holdings of American stocks, but it would now appear that liquidation is proceeding because of the apprehension that the expected heavy issue of United States bonds may cause some disarrangement of financial matters. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com.	25½ - 28	Int. Har. Corp., com.	78 - 79⅛
Am. Can, com.	43½ - 50½	Int. Har. Corp., pref.	111
Am. Can, pref.	106⅛ - 106⅞	Lacka. Steel	80 - 86⅝
Am. Car & Fdy., com.	64¾ - 69	Lake Sup. Corp.	19 - 21¼
Am. Car & Fdy., pref.	116 - 116⅛	Lima Loco.	54 - 58
Am. Loco., com.	65⅝ - 70⅝	Lukens, com.	42
Am. Loco., pref.	103¼	Lukens, 1st pref.	100 - 100½
Am. Rad., com.	296	Midvale Steel	57⅛ - 61⅝
Am. Ship, com.	73½ - 77	Nat.-Acme	32⅝ - 34
Am. Ship, pref.	95	Nat. En. & Stm., com.	33 - 35⅛
Am. Steel Fdries.	55 - 62	Nat. En. & Stm., pref.	97½ - 98
Bald. Loco., com.	51 - 61⅜	N. Y. Air Brake	140 - 148
Bald. Loco., pref.	101 - 101¼	Nova Scotia Steel	95 - 99
Beth. Steel, com.	133⅞ - 149	Pitts. Steel, pref.	100
Beth. Steel, class B	123 - 142⅝	Pressed Stl., com.	73⅞ - 77
Carbon Stl., com.	88	Pressed Stl., pref.	102 - 103
Central Fdry., com.	23½ - 28	Ry. Steel Spring, com.	46 - 51
Central Fdry., pref.	44 - 48¼	Republic, com.	76 - 83⅞
Charcoal Iron, com.	6¾ - 7	Republic, pref.	102¼ - 102⅞
Chic. Pneu. Tool	68½ - 69¼	Sloss, com.	56½ - 68⅝
Colo. Fuel	45⅜ - 52¼	Sloss, pref.	93
Cruc. Steel, com.	60½ - 71⅝	Superior Steel	33½ - 34⅝
Cruc. Steel, pref.	109⅞ - 111	Superior Steel, 1st pref.	99 - 100
Deere & Co., pref.	98 - 99	Transue-Williams	41⅛ - 44¼
Driggs-Seabury	75 - 87⅛	Un. Alloy Steel	43½ - 45⅞
Gen. Electric	161½ - 164¼	U. S. Pipe, com.	19⅛ - 20¼
Gt. No. Ore Cert.	30⅛ - 33⅝	U. S. Pipe, pref.	55
Gulf States Stl.	115 - 124	U. S. Steel, com.	108⅜ - 116⅜
Gulf States Stl., 1st pref.	106⅜	U. S. Steel, pref.	117½ - 118⅝
Int. Har. of N. J., com.	116	Va. I. C. & Coke	64½ - 70½
		Westing. Elec.	47½ - 52½

Dividends

The American Shipbuilding Company, regular quarterly, 1¾ per cent on the preferred, payable April 16.

The Harbison-Walker Refractories Company, regular quarterly, 1½ per cent on the preferred, payable April 20.

The Midvale Steel & Ordnance Company, regular quarterly, $1.50 per share, payable May 1.

The United Alloy Steel Corporation, regular quarterly, $1 per share, payable April 21.

The Six Metric Myths

The six metric myths is the subject of a bulletin issued by the American Institute of Weights and Measures, 20 Vesey Street, New York. These myths, which are elaborated upon, are enumerated as follows:

1. The system is in universal use except in the United States, the British Empire and Russia, and frequently Russia is placed in the metric column.

2. The adoption of the system is easy and the transition period short.

3. There exists a confusion in our weights and measures and the system should be adopted in order to get rid of it.

4. The system leads to an important saving of time in calculations.

5. The system leads to an important saving of time in primary education.

6. The adoption of the system is important in the interest of foreign trade.

Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c. Denver, pipe, 76.1c., minimum carload, 46,000 lb.; structural steel and steel bars, 83.6c., minimum carload, 36,000 lb. Pacific coast (by rail only), pipe, 65c.; structural steel and steel bars, 75c., minimum carload, 50,000 lb.; structural steel and steel bars, 80c., minimum carload, 40,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 3.60c. to 3.75c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in., on one or both legs	.10
Angles, 3 in. on one or both legs less than ¼ in. thick, as per steel bar card, Sept. 1, 1909	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail)	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909	.20 to .80
Deck beams and bulb angles	.30
Handrail tees	.75
Cutting to lengths, under 3 ft. to 2 ft. inclusive	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting to lengths 3 ft. and over.

Plates.—Tank plates, ¼ in. thick, 6 in. up to 100 in. wide, 4.50c. to 6c., base, net cash, 30 days, or ½ of 1 per cent discount in 10 days, carload lots. Extras are:

Quality Extras

	Cents per lb.
Tank steel	Base
Pressing steel (not flange steel for boilers)	.10
Boiler and flange steel plates	.15
"A. B. M. A." and ordinary firebox steel plates	.20
Still bottom steel	.30
Locomotive firebox steel	.50

Marine steel, special extras and prices on application.

Gage Extras

Rectangular, ¼ in. thick, over 6 in. wide to 100 in. wide	Base
Lighter than ¼ in., to 3/16 in., up to 72 in. wide	.10
*Lighter than ¼ in., including 3/16 in., over 72 in. to 84	.20
*Lighter than ¼ in., including 3/16 in., over 84 in. to 96	.30
*Lighter than ¼ in., including 3/16 in., over 96 in. to 100	.40
*Lighter than ¼ in., including 3/16 in., over 100 in. to 102	.45
Lighter than 3/16 in., including No. 8, up to 72 in. wide	.15
*Lighter than 3/16 in., including No. 8, over 72 in. to 84	.25
*Lighter than 3/16 in., including No. 8, over 84 in. to 96	.35
Lighter than No. 8, including No. 10, up to 60 in. wide	.30
Lighter than No. 8, including No. 10, over 60 in. to 64	.35

Up to 72 in. and not less than 10.2 lb. per sq. ft. will be considered ¼ in.
Over 72 in. must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft. to take base price.
Over 72 in. wide, ordered less than 11 lb. per sq. ft., down to weight of 3/16 in., take price of 3/16 in.
Over 72 in., ordered weight 3/16 in., take No. 8 price.
Over 72 in., ordered weight No. 8, take No. 10 price.

Width Extras

Over 100 in. to 110 in. inclusive	.05
Over 110 in. to 115 in. inclusive	.10
Over 115 in. to 120 in. inclusive	.15
Over 120 in. to 125 in. inclusive	.25
Over 125 in. to 130 in. inclusive	.50
Over 130 in.	1.00

Length Extras

Universal plates 80 ft. long up to 90 ft. long	.05
Universal plates 90 ft. long up to 100 ft. long	.10
Universal plates 100 ft. long up to 110 ft. long	.20

Cutting Extras

No charge for rectangular plates to lengths 3 ft. and over.

Lengths under 3 ft. to 2 ft. inclusive	.25
Lengths under 2 ft. to 1 ft. inclusive	.50
Lengths under 1 ft.	1.55
Circles 3 ft. in diameter to 100 in.	.30
Circles over 100 to 110 in. (width extra)	.35
Circles over 110 to 115 in. (width extra)	.40
Circles over 115 to 120 in. (width extra)	.45
Circles over 120 to 125 in. (width extra)	.55
Circles over 125 to 130 in. (width extra)	.80
Circles over 130 in. (width extra)	1.30
Circles under 3 ft., to 2 ft., inclusive	.55
Circles under 2 ft., to 1 ft., inclusive	.80
Circles under 1 ft.	1.85

Half circles take circle extras.
Sketches not over four straight cuts, inc. straight taper .10
Sketches having more than four straight cuts .20
Plates sheared to a radius take complete circle extras.

*Including extra for width.

Wire Rods.—Including chain rods, $85.

Wire Products.—Prices to jobbers, effective March 5: Fence wire Nos. 6 to 9, per 100 lb., terms 60 days or 2 per cent discount in 10 days, carload lots, annealed, $3.15; galvanized, $3.85. Galvanized barb wire and staples, $4.05; painted, $3.35. Wire nails, $3.20. Galvanized nails, 1 in. and longer, $2.20 advance over base price; shorter than 1 in., $2.70 advance over base price. Cement-coated nails, $3.10. Woven wire fencing, 51 per cent off list for carloads, 50 off for 1000-rod lots, 49 off for less than 1000-rod lots.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card in effect from April 2, 1917, all full weight:

Butt Weld

Steel: Inches	Black	Galv.	Iron: Inches	Black	Galv.
⅛, ¼ and ⅜	48	21½	⅛ and ¼	36	9
½	52	37½	⅜	37	10
¾ to 3	55	41½	½	41	23
			¾ to 1½	44	28

Lap Weld

2	48	35½	1¼	29	14
2½ to 6	51	38½	1½	36	22
7 to 12	48	34½	2	37	23
13 and 14	38½	..	2½ to 4	39	26
15	36	..	4½ to 6	39	26
			7 to 12	38	25

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	44	26½	⅛, ¼ and ⅜	35	18
½	49	36½	½	40	27
¾ to 1½	53	40½	¾ to 1½	44	29
2 to 3	54	41½			

Lap Weld, extra strong, plain ends

2	46	34½	1¼	30	15
2½ to 4	49	37½	1½	36	22
4½ to 6	48	36½	2	38	25
7 to 8	44	30½	2½ to 4	40	28
9 to 12	41	25½	4½ to 6	39	27
			7 to 8	33	21
			9 to 12	28	16

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized, but in some sections of the country discounts on less than carloads are three (3) points less (higher price) than the carload discount on both black and galvanized steel pipe.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are four (4) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are five (5) points lower (higher price).

Boiler Tubes.—Nominal discounts on less than carloads, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes, and from April 2, 1917, on lap welded steel tubes, are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths.

Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets.—Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net, or 2 per cent discount in 10 days:

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8	4.95 to 5.50
Nos. 9 and 10	5.00 to 5.50
Nos. 11 and 12	5.05 to 5.55
Nos. 13 and 14	5.10 to 5.60
Nos. 15 and 16	5.20 to 5.70

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	5.30 to 5.55
Nos. 22 and 24	5.35 to 5.60
Nos. 25 and 26	5.40 to 5.65
No. 27	5.45 to 5.70
No. 28	5.50 to 5.75
No. 29	5.55 to 5.80
No. 30	5.65 to 5.90

Galvanized, Black Sheet Gage—Bessemer

Nos. 10 and 11	6.00 to 6.50
Nos. 12 to 14	6.10 to 6.60
Nos. 15 and 16	6.35 to 6.85
Nos. 17 to 21	6.40 to 6.90
Nos. 22 and 24	6.55 to 7.05
Nos. 25 and 26	6.70 to 7.20
No. 27	6.75 to 7.25
No. 28	7.00 to 7.50
No. 29	7.15 to 7.65
No. 30	7.30 to 7.80

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	5.30 to 5.55
Nos. 17 to 21	5.35 to 5.60
Nos. 22 to 24	5.40 to 5.65
Nos. 25 to 27	5.45 to 5.70
No. 28	5.50 to 5.75
No. 29	5.55 to 5.80
No. 30	5.55 to 5.80
Nos. 30½ and 31	5.60 to 5.85

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
April	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
4	34.00	34.00	54.75	9.35	9.15	10.67½	10.42½
5	33.75	33.75	54.62½	9.35	9.15	10.67½	10.42½
6	33.50	33.50	54.62½	9.35	9.15	10.50	10.25
7	33.25	33.25	....	9.35	9.15	10.50	10.25
9	33.00	33.00	54.50	9.35	9.15	10.25	10.00
10	33.00	33.00	54.62½	9.35	9.15	10.25	10.00

NEW YORK, April 11, 1917.

All the metals are dull and uninteresting. Copper is quiet and weaker. Tin is steady and fairly strong. Lead is quiet and unchanged. Spelter is receding on continued offerings. Antimony is nominally unchanged.

New York

Copper.—With evidently more sellers than buyers, the tendency of the past week has been distinctly downward, and the market is heavy and dull. Future copper for delivery during the third quarter could be bought the middle of last week at about 29.50c., New York, and later at 29c. May and June electrolytic has been offered at close to 32c., New York, but no reports have been heard of any business being done. The dominating factor seems to be uncertainty as to just what course the market will take in case large quantities are sold to the Allies for the last half of this year, and especially the price at which this will go. The quotation yesterday was 33c., New York, for both Lake and electrolytic. There is no change in the London quotation for spot electrolytic, which was £151 yesterday.

Tin.—The entire week has been extremely dull, and sales have been very few. In spite of this the market has been steady and firm. On April 5 a moderate business was done quietly in metal for future shipment from the East. On Monday a little business was done in spot metal at 54.50c. to 54.60c., New York, with 54.37½c. asked ex-steamer at dock. More business could have been done had there been more sellers, the latter being generally reluctant. An interesting announcement is the building of a plant by the Williams Harvey Corporation to smelt Bolivian tin ores on Long Island. The output will be 300 tons per month at first, but this will be entirely absorbed by the National Lead Company, which is heavily interested in the proposition. The quotation for spot Straits yesterday was 54.62½c., New York. The arrivals are reported as 1490 tons, and the amount afloat at 3012 tons. The London quotation for spot Straits yesterday was £216 5s., an advance of a little over £2 from last week.

Lead.—A vague rumor is prevalent that producers have agreed to sell lead to the Government at 4.70c., but it has been entirely impossible to verify this. One metal broker placed the probable figure at 6c., but the trade is more or less in the dark as to what has been or will be done. The market is quiet and dull, and the generally well sold up condition of producers maintains it in a firm position. Some business has been done at 9.37½c., delivered at Eastern points, which is higher than the usual differential over the St. Louis quotation of 9.15c. Quotations yesterday were 9.35c., New York, and 9.15c., St. Louis, with that of the leading interest unchanged at 9c., New York.

Spelter.—The stagnation which has characterized the market for several weeks is gradually developing into weakness, and prices are receding. Prompt and April metal can be bought to-day at 9.75c. to 10c., St. Louis, or 10c. to 10.25c., New York. Some producers are offering their product freely, but not many sales are reported. The market is more or less nominal. It is reported that 9.75c., St. Louis, or 10c., New York, can be done.

Antimony.—Sales of spot metal are reported at 36c. to 37c., but not much is available, although more is offered than a week ago. The quotation is nominal at 36c. for Chinese and Japanese grades.

Aluminum.—The market is unchanged at 59c. to 60c. for spot No. 1 virgin aluminum, 98 to 99 per cent pure.

Old Metals.—The market is very quiet. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible	32.00 to 32.50
Copper, heavy and wire	31.00 to 32.00
Copper, light and bottoms	27.00 to 27.50
Brass, heavy	20.00 to 20.50
Brass, light	15.75 to 16.00
Heavy machine composition	26.00 to 26.50
No. 1 yellow rod brass turnings	20.50 to 21.00
No. 1 red brass or composition turnings	23.00 to 24.00
Lead, heavy	8.625
Lead, tea	8.25
Zinc	9.00

Chicago

APRIL 10.—The copper market is paradoxical in that consumption is good but buying is quiet. Most of the metals are dull and easier. We quote: Casting copper, 31c.; Lake, 34c.; electrolytic, 33.75c.; tin, car loads, 55c., and small lots, 57c.; lead, 9.125c.; spelter, 10c.; sheet zinc, 21c.; oriental antimony firm at 38c. On old metals, we quote buying prices for less than car load lots as follows: Copper wire, crucible shapes, 27c.; copper clips, 26c.; copper bottoms, 24c.; red brass, 24c.; yellow brass, 17.50c.; lead pipe, 8c.; zinc, 8c.; pewter, No. 1, 32c.; tinfoil, 40c.; block tin pipe, 45c.

St. Louis

APRIL 9.—Prices at the close to-day are as follows: Lead, carload lots, 9.12½c.; spelter, carload lots, 10c. to 10.37½c. In less than carload lots the quotations are: Lead, 10c.; spelter, 11.50c.; tin, 59c.; Lake copper, 35c.; electrolytic copper, 34.50c.; Asiatic antimony, 40c. In the Joplin district zinc blende sold at from $70 to $85 per ton, with the average for the district $77. Calamine was quiet at $40 to $47, with the average for the district $41. Lead ore was steady at $115, with the average $112. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 12.50c.; heavy yellow brass, 13.50c.; heavy red brass and light copper, 19.50c.; heavy copper and copper wire, 23c.; pewter, 25c.; tinfoil, 36c.; zinc, 7c.; lead, 5.50c.; tea lead, 3.50c.

Ingersoll-Rand Statement

The statement of the Ingersoll-Rand Company for the year ended Dec. 31, 1916, shows a very handsome increase in net earnings, as compared with the preceding year. The income account follows:

	1916	1915
Net earnings	$7,925,156	$5,459,884
Depreciation	619,539	647,807
Balance	$7,305,616	$4,812,077
Int. and prem. on bonds	50,000	125,000
Balance	$7,255,616	$4,687,077
Preferred dividends	151,518	151,518
Balance	*$7,104,098	$4,535,559
Special reserve	.....	.....
Surplus	$7,104,098	$4,535,559

*Equal to $65.17 per share on $10,900,035 common stock, against $53.55 on $8,469,400 common stock previous year.

Bethlehem Production Records

Records are being broken at the Bethlehem Steel Company's plants with unusual frequency. It was given out April 9 that the 40-in. blooming mill of the Saucon plant broke its March record when it made 35,257 tons, the previous record having been 32,908 tons, in November, 1916. The Bessemer department of the Saucon plant broke a long-standing record when it produced 41,167 tons in March, as against 39,689 tons previously. The blast-furnace department at South Bethlehem continues breaking records too. Furnace E produced 16,578 tons in March, while furnace F produced 19,769 tons in the same month, against a previous record of 18,419 tons.

POSTURE AT WORK

Influence of Occupation or Height of Furniture Upon the Chest and Spine

IMPERFECTIONS such as rounded shoulders, shoulders of unequal height or the head protruding in front of the shoulders will be revealed in large numbers if the workers emerging from a factory or the various types coming from an office building in the evening are watched, says the January *Bulletin* of the Pennsylvania Department of Labor and Industry. It is impossible to attribute their presence to any one factor. The cause may be fatigue, especially that produced by long standing, seats that are too high or too low, seats without backs or ones that do not support the muscles of the back at the point where support is required, the work benches or desks may be of a height not suited to the worker or the light may be insufficient.

Causes of Physical Imperfections

The main cause lying with the worker himself is habit which may have been formed in childhood in the schoolroom or in early youth when the individual was growing rapidly, or it may be the result of constrained positions assumed in the hurry and anxiety to increase the output of work, this last being especially true of piece workers.

The slouching attitude indicated by the rounded shoulders, the contracted chest and usually accompanied by the protruding head, is found most frequently in hand workers who bend over their work, such as cigar makers, cobblers, tailors, watchmakers, engravers and woodworkers. As the shoulders are permitted to droop forward the chest is narrowed and the lungs crowded closely together, thus cutting off absolutely the possibility of taking a full breath while in this position. Lack of air is not the only ill effect of such posture, for with the chest contracted the diaphragm is forced down and the various organs contained in the abdomen displaced to a greater or less extent, producing disturbances of the digestive system if nothing more serious.

Part Played by Improper Furniture

Desk workers are frequently affected with the elevation or depression of one shoulder, the curvature of the spine to one side in the lower portion instead of being backward in the upper portion of the back and forward near the waist line. This position permits one lung to be expanded freely but crowds the other into a much reduced space with a resultant decreased aeration of the blood with all its evil consequences just as in a general contraction of the chest. This condition is found very frequently in desk workers, especially those whose chairs and desks are not of the proper height to permit them to perform their work without assuming constrained attitudes. Chairs should be of such a height that when seated well back on the chair the occupant's feet rest flat on the floor with the legs at right angles to the highs.

A large industrial establishment in the Middle West employs a man whose duty it is to adjust the chair of every new employee to fit his exact needs, and since this plan was employed an increase in the amount of work turned out and a decrease in the fatigue of the workers has been noted. Desks or work benches that are too high or too low induce, in a person who rests one hand or arm on such support, either elevation or depression of the corresponding shoulder.

This condition is also found in occupations requiring the long continued use of heavy hammers swung always by the same arm, in individuals carrying heavy loads upon the same shoulder, in porters using one hand more than the other and in persons tending machines or doing other work requiring prolonged standing. The tendency in the last case is to rest the body by changing the position, which too often means shifting the weight of the body to one leg with an elevation of the corresponding hip and the opposite shoulder.

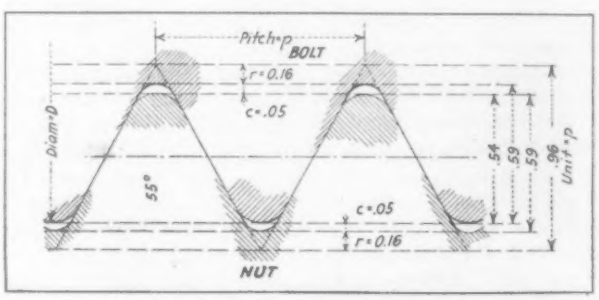
How Defects Can Be Remedied

These departures from the normal posture appear in every degree from a slight and almost imperceptible curvature to a marked deformity and produce corresponding deviations from normal health. It is pointed out that while every employer should endeavor to obtain the best possible working conditions for his employees, such as suitable seats, proper desks or work benches, sufficient light falling upon the work at the correct angle and frequent change of position in work requiring close application, this alone is not sufficient, for unless the workman can be made to realize the necessity for corrrect posture he will be benefited very little.

In most establishments little more can be done than to call attention of all the workers to the danger consequent upon the assumption of incorrect postures. Definite instruction to bend the body at the waist instead of at the shoulders in work requiring close application will not only eliminate the hump on the back, but will diminish fatigue to a surprising extent. In addition to general instructions, individual workers can be singled out and their defects corrected by advising suitable calisthenics or by refering the individual to a physician for treatment.

Proposed Modification of Whitworth Thread

A modification of the Whitworth system of screw threads is proposed by Dr. W. C. Unwin in *Engineering*, Feb. 16, 1917. The object of the modification is to facilitate the manufacture of interchangeable screws



The Proposed Modification of the Whitworth Thread

and nuts by making permissible larger tolerances on certain portions of the threads.

For an interchangeable fit of bolt and nut on the Whitworth system the following conditions are necessary and must be simultaneously satisfied: (1) Exactness of pitch, which ultimately depends on the exactness of the leading screws of lathes. (2) Exactness of the angle of thread, which depends on the grinding of the chasing tool. In grinding the tool point the cutting clearance angle must be allowed for, and the rounding properly effected. (3) Exactness of crest diameter. (4) Exactness of root diameter. (5) Exactness of effective diameter, on which the fit of the slopes of the threads of bolt and nut depends.

The pitch and angle of thread are independent quantities, as to which no concession can be made except such a tolerance as may be decided on.

A clearance between the crests and roots of the threads on bolts and nuts of 0.05 p has been provided in the modified standard. The effective diameter is made $D - 0.54\ p$ instead of $D - 0.64\ p$, as in the normal thread, D and p being the diameter at the crest of the bolt and p the pitch respectively. The sketch shows the relative proportions of the various parts of the modified thread.

With the recent purchase by the Nagle Steel Company, Pottstown, Pa., of a good plate mill, with 23 x 54 in. rolls, engine, shears, etc., for the Potts Brothers plant, which the company has acquired, it will not be long before another local industry will be in operation. The old skelp mill and engines long used by Potts Brothers have been dismantled, and excavations are now being made for the new equipment.

Labor Notes

The union jobbing foundries of Buffalo recently advanced the minimum wage from $3.75 to $4.25 per day, in response to a demand by the union. Late in February an effort was made by molders in one open shop in Buffalo to unionize it. Several were discharged. Some of the men were replaced, and the shop remained non-union on a piece-work basis.

Because of a refusal to raise wages a strike is on at the plant of the John Wood Mfg. Company, Conshohocken, Pa. The employees were refused an increase of 5 per cent.

The American Chain Company, York, Pa., on April 7 distributed a bonus of $8,000 among machinists in its employ. Each of the 100 men received 10 per cent of his compensation during the last year. The bonus had been granted by the Standard Chain Company, which was absorbed by the American Chain Company.

The Empire Steel & Iron Company, furnace operator, and the Davies & Thomas Company, foundry, Catasauqua, Pa., have announced 5 per cent wage increases to employees, effective April 1.

The Lebanon Valley Iron & Steel Company, Lebanon, Pa., has increased the wages of puddlers $1 per ton, making the rate $8.50, effective April 2. This is the second increase this year.

The Parish Mfg. Company, Reading, Pa., manufacturer of heavy frames for automobiles, has announced a wage advance of 10 per cent to all employees.

The Lehigh Car Wheel & Axle Works, Fullerton, Pa., has advanced all employees 25 cents per day.

The Barrett Company, Philadelphia, a New Jersey corporation, has filed a certificate at Trenton as an amendment to its charter granting the company permission to inaugurate and carry out such bonus plans or profit-sharing plans as may be deemed advisable, and to use proper funds for such purposes.

The Youngstown Sheet & Tube Company, Republic Iron & Steel Company, Brier Hill Steel Company, Sharon Steel Hoop Company, the latter now owning and operating the Youngstown Iron & Steel Company, and in fact practically all owners of blast furnaces and steel works in western Pennsylvania and eastern Ohio, have announced that they will also pay the 10 per cent advance in wages recently granted by the United States Steel Corporation, to be effective from May 1. The rate for common labor in the Mahoning and Shenango valleys is expected to be 30c. per hr., this rate constituting an advance of 54 per cent since early 1916.

The American Stamping & Enameling Company, Massillon, Ohio, has adopted a bonus system under the terms of which every employee who remains with the company until Dec. 15 will receive 5 per cent of his earnings for the entire period of his employment in 1917.

The Deming Company, Salem, Ohio, will pay a bonus to its employees to encourage more regular attendance. To each one who works full time in his department, a premium of 10 per cent will be paid. However, he will not be deprived of the bonus should he be absent because of an accident that occurs while he is at work.

Safety Inspection Work in Pennsylvania

Inspections of industrial plants and visits for preventing and investigating accidents and performing other work of the Bureau of Inspection of the Pennsylvania Department of Labor and Industry numbered 72,931 in the first eleven months of 1916. As a result of these visits 11,489 separate instruction orders were issued for the installation of safeguards and other precautions for the protection of the life and health of the workers, the improvements called for ranging from the erection of fire escapes to the clearing out of cellars for the prevention of fire and the installation of safeguards on gears and other unprotected parts of machinery. Of these orders 8362 had been complied with satisfactorily by the employers to Nov. 30. The Bureau handles the investigation of complaints of unpaid workmen's compensation, investigates accidents, approves building plans and has charge of steam boiler inspection.

Hydraulic Press Company's Expansion

Plans are completed and in course of execution for rebuilding the burned portion of the plant of the Hydraulic Press Mfg. Company, on its present site in Mount Gilead, Ohio. The plans include the erection of two additional buildings to secure more adequate manufacturing facilities for the company's expanding business. In all, there will be four completely new buildings, consisting of a machine shop, a stock-room building, an additional power plant and a structural and forge shop. The machine shop and stock room are replacements on a much larger scale of the portion of the plant recently destroyed by fire.

The new machine shop will be 200 ft. long and 100 ft. wide and of fire-proof construction. Steel, brick and concrete will be used throughout, including steel window frames and sashes. Its floor space will be 100 per cent greater than the building which it replaces. A 20-ton electric traveling crane, operating on a track running the entire length of the structure, will facilitate the lifting and moving of heavy hydraulic-machinery castings in the course of their manufacture. Two 3-ton electric cranes will be operated in each side wing. Considerable other new machinery will be installed, consisting in part of boring mills, milling machines, lathes, planers, etc. The stock-room building, consisting of three stories, will occupy a ground space of 50 x 60 ft. Access to all floors will be gained by an electric elevator which will more efficiently provide for the moving and storing of accessories, parts, repairs, etc., than the burnt building used for this purpose.

The new power plant will occupy a space of 42 x 60 ft. It will be of fire-proof construction—composed of steel, concrete and brick—and will be of pleasing exterior architectural design. For furnishing the power a new 300-hp. Corliss engine and a 30-hp. water-tube boiler, equipped with an automatic stoker, will be installed. The present power plant will remain intact, so that it can be used in case of emergency or as an auxiliary. It is claimed that the new power plant will be one of the most complete of its class in central Ohio. For fabricating its requirements of structural steel, the company proposes to erect a structural and forge shop, 50 x 60 ft., immediately east of the present erecting shop. Cut off saws and other equipment will be installed. It is planned to have the new buildings completed and equipped for full operation by July 1.

Removing Rust from Badly Pitted Steel

A method of removing rust from corroded and pitted iron plates, claimed to be easy, cheap, and effective, has been evolved from experiments carried out by the Consolidated Gold Fields Laboratory, South Africa. It consists in applying to the surface of the iron a mixture of 2 parts of finely crushed sodium bisulphate and 1 part common salt. This mixture is prepared, then moistened just sufficiently to be cohesive, and applied to the plate. The moist mixture can be left till the plate is clean, but the action is more rapid if the mixture is scraped off every two or three hours and the iron scrubbed thoroughly with a wire brush and water. The treatment is repeated till the plate is clean. Usually 24 hours is sufficient for a badly corroded plate. When the plate is thoroughly clean it is well washed with an alkaline solution, and dried quickly. A coating of paraffin oil is at once applied to protect the surface against oxidation. The metal is then ready for the paint or other protective covering. The method is stated to be more effective than hammering, chiselling, the use of wire brushes or even a sand blast.

Some electric traveling cranes have recently been sold on the basis of cost at time of manufacture and 10 per cent.

PERSONAL

T. J. Bray, president Republic Iron & Steel Company, Youngstown, Ohio, announces the following appointments, effective from April 1: John M. Reese, in charge of mining operations, with the title of assistant to general manager; C. E. Crowthers to succeed Mr. Reese as superintendent of Northern blast furnace; A. W. Haven to succeed C. E. Crowthers as superintendent of Haselton furnaces at Haselton, Ohio.

W. C. Reynolds, general manager of the W. Harry Brown coal mining and coke interests in Fayette and Greene counties, has resigned. He has no present plans for engaging in active business.

Albert C. Barbour, superintendent of the plant of the Lawrenceville Bronze Company, now located at Zelienople, Pa., has been made district sales agent, with headquarters in Pittsburgh.

W. H. Eshleman, plate-mill roller with the Republic Iron & Steel Company, Youngstown, Ohio, has resigned to become superintendent of the plate-mill department of the Youngstown Sheet & Tube Company, at East Youngstown, Ohio.

President Waddill Catchings of the Sloss-Sheffield Steel & Iron Company announces the election by the directors of Vice-President J. W. McQueen as First Vice-President, and Vice-President J. C. Maben, Jr., as Second Vice-President. Mr. Catchings will retire from the presidency of the Central Foundry Company and Central Coal & Iron Company, but will retain his connection with the Platt Iron Works Company, Dayton, Ohio. He will divide his time between Birmingham and New York.

C. H. Newcomb, manager of sales of Crocker Brothers, Philadelphia, has returned from a sojourn of over three months at Pinehurst, N. C., his health having been completely restored.

George W. Short, vice-president of the Sharon Steel Hoop Company, Sharon, Pa., and general manager in charge of the works in that city, has been made vice-president and will have charge of all the company's plants in the Shenango and Mahoning valleys. Charles B. Cushwa, who has been elected a director, succeeding J. P. Whitla, becomes general superintendent of the Mahoning Valley plants, and Noble Jones will be general superintendent of the Sharon plants.

Sir Robert Hadfield, the eminent British metallurgist, has given an unsolicited contribution of $100 to the Steel Treating Research Club of Detroit, Mich.

Norman Bell, sales engineer in the automobile division of the Lunkenheimer Company, Cincinnati, has joined the Norma Company of America, maker of bearings, and will act in a similar capacity.

S. S. MacIntosh, formerly connected with the Strong, Carlisle & Hammond Company, Cleveland, and James G. Nixon, formerly with the Chambersburg Engineering Company, Chambersburg, Pa., are now associated with the Cleveland office of Manning, Maxwell & Moore, Inc.

W. H. Alison, for 35 years connected with the Pacific Coast Steamship Company and its successor, the Pacific Steamship Company, Seattle, Wash., has resigned his position as superintending engineer. He obtained his early training with the William Cramp & Sons Ship & Engine Building Company, Philadelphia, and the Risdon Iron & Locomotive Works, San Francisco. He will be succeeded by John D. Gilmore, chief engineer of the Union Iron Works, San Francisco.

John Eadie has been appointed general manager of the Wallace Shipyards, North Vancouver, B. C.

John Jordan, Jr., president Williams Tool Company, Erie, Pa., will return April 15 from his winter's sojourn in the South.

A. E. Woolsey has severed his connection with the Anniston Steel Company, Anniston, Ala., and is now located at 30 Church Street, New York, room 325 E.

Norman L. Baker has been appointed works engineer of the American Steel Foundries, East St. Louis, Ill. He formerly was mechanical engineer with the By-Products Coke Corporation, Chicago.

George W. Rice has resigned as works manager of the Aultman & Taylor Machine Company, Mansfield, Ohio, to become assistant general factory manager with the Curtiss Aeroplane & Motor Corporation, Buffalo.

Leon P. Alford is now identified with *Industrial Management*, formerly *Engineering Magazine*, as editor in chief. He was editor of the *American Machinist* for about 10 years. *Industrial Management* is shortly to move its offices and will be located at 6 East Thirty-ninth Street, New York.

The Taylor-Wharton Iron & Steel Company, High Bridge, N. J., has re-elected the following officers: Knox Taylor, president; V. Angerer and Dr. H. M. Howe, vice-presidents; W. A. Ingram, secretary and treasurer, and Llewellyn N. Aller, assistant secretary and assistant treasurer. An additional vice-president, P. Chrystie, was elected.

J. Morgan Clements, trade commissioner of the Bureau of Foreign and Domestic Commerce, Department of Commerce, is making a short stay in New York prior to leaving for the Pacific Coast, where he will sail early in May for Japan and China. Mr. Clements is being sent by the Government to investigate the Far Eastern market in regard to investments in mineral and engineering lines with a view to promoting closer trade relations. He wishes to get in touch with firms or individuals interested in these lines, and may be reached through the Bureau office in the Custom House.

J. M. Schlendorf, who has been appointed director of sales of the Central Steel Company, Massillon, Ohio, was associated with the United States Steel Corporation for 14 years, during which time he was in the sales organization of the American Sheet & Tin Plate Company. For the last two years he has been with the Willys-Overland Company, Toledo, Ohio, directly in charge of its purchases of special steels and all metals. He has given much attention to the manufacture and uses of alloy steels, thus gaining special qualifications for his new position.

American Iron, Steel and Heavy Hardware Association Meeting

The eight annual convention of the American Iron, Steel and Heavy Hardware Association, held at New Orleans, March 27-29, was attended by nearly 200 active and associate members, ladies and guests. A prominent feature of the meeting was an address on the business outlook by Frank Baackes, vice-president and general sales agent of the American Steel & Wire Company, who discussed business conditions and prospects in a comprehensive manner and closed by a highly patriotic statement in regard to the attitude during the war of American citizens who were born in Germany. E. P. Sanderson, Boston, presented an able paper on "Remuneration of Salesmen," in which he heartily indorsed profit-sharing. Another paper which attracted much attention was by S. L. Orr, Orr Iron Company, Evansville, Ind., who discussed business conditions from the viewpoint of the jobber. A resolution was adopted and telegraphed to the President, assuring him whole-hearted support and unwavering loyalty and expressing the conviction that he will be wisely guided through these trying times.

The following officers were elected for the year: President, E. F. Yarnelle, Mossman, Yarnelle & Co., Fort Wayne, Ind.; first vice-president, F. H. Butts, Butts & Ordway Company, Boston, Mass.; second vice-president, W. H. Grant, Bonniwell-Galvin Iron Company, Kansas City, Mo. Members of the executive committee for three years: S. L. Orr, Orr Iron Company, Evansville, Ind., and John S. Proctor, Minneapolis Iron Store Company, Minneapolis, Minn. For two years, to complete the unexpired term of Mr. Grant, E. J. McCarthy, Beals & Co., Buffalo, N. Y.

The selection of the next place of meeting was left to the executive committee. Numerous entertainment features contributed to the success of the convention.

Pittsburgh and Nearby Districts

The Carnegie Steel Company is getting ready to start its blast furnace at Niles, Ohio, its Neville Island furnace at Pittsburgh, and its furnace at Steubenville, Ohio. They were blown out several months ago when the coke shortage began to pinch, but now that the supply of fuel is much better, and promises to continue, they will be started as soon as they can be made ready. The fact that the Niles and Steubenville, which are isolated stacks, are to be started emphasizes the pressing needs of the Carnegie Company for metal.

Railroads in the Pittsburgh district have effected an agreement to close their offices to outbound freight at 4:30 p. m. on all week days, except Saturday, when the closing hour will be 12:30 p. m. It is believed that by adopting the early closing hours for outbound freight, the movement of freight will be much facilitated, and that it will go far toward relieving the congestion in Pittsburgh, which has existed so long.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, has taken title to about 273 acres of coal lands in Greene County, Pa., for which the purchase price is said to have been $515 per acre.

Henrietta S. Keith has applied for an injunction to restrain the directors of the Carbon Steel Company, Pittsburgh, from paying an extra dividend of 2 per cent on the common stock, which is to become payable May 22. A hearing will be had on the motion April 16. Both the common stockholders and the second preferred stockholders of the company received 6 per cent dividends on their stock in 1916.

The Standard Slag Company, Youngstown, has increased its capital from $250,000 to $550,000. It is now issuing $150,000 of preferred stock, the proceeds of which will be used to buy new equipment and to increase the working capital. The company buys and reduces the slag of a large number of blast furnaces in Ohio and western Pennsylvania. It has plants at Sharpsville, Pa., and at Hubbard, Canal Dover, Youngstown, Jackson, Ironton, and Leetonia, Ohio. In 1916 it handled about 750,000 tons of slag and plans to handle this year about 1,000,000 tons. The product is used mostly for building roads.

The Cuyuna-Minneapolis Iron Company, Minneapolis, recently organized, with a capital of $1,000,000, has opened offices at 801 B. F. Jones Law Building, Pittsburgh. J. S. Milder and J. S. Notestein are in charge of the Pittsburgh office. The company, which is headed by Franklin W. Merritt, is developing manganiferous ore properties in Crow and Atkins counties, Minn., where it owns 860 acres of ore lands.

The McCairns Foundry Company, Connellsville, Pa., is in need of a 5-ton 36-ft.-span electric traveling crane, with hand-operated cross pulley and hoist, and a one or two-ton 18-ft.-span hand traveling and hoisting crane. It will award a contract about April 15 for an addition to its foundry, 60 x 65 ft., one story, to cost $10,000. F. S. McCairns is secretary and treasurer.

The Williams Tool Company, Erie, Pa., manufacturer of pipe-threading and bolt-cutting machinery, has awarded a contract to the W. M. Graham Company for a one-story addition to its machine shop, 45 x 145 ft., to enable it to speed up its business. It will also add a special building for its die department. The improvements will cost about $18,000.

The Chilean Tin Smelting Company has been organized to establish a tin-smelting plant at Arica, Chile, to treat Bolivian tin concentrates. The committee of engineers in charge is announced as Guillermo Yunge, Durevard Copeland and Richard Gabler. Mr. Copeland is a professor of metallurgy at the Missouri School of Mines and has traveled in Cornwall, China, Straits Settlements and Bolivia. He will import the necessary skilled labor. Tin ingots, 99.75 per cent pure, will be made. It is said that the smelter will have about 7000 tons of 60 per cent tin barilla from Llallagua Mines of Bolivia and should easily find 3000 to 5000 tons more from other producers. Construction work has already been started.

OBITUARY

GEORGE E. WEED, engineer and shipbuilder, died at his home in New York, April 7, in his 78th year. He was born in Danbury, Conn., Oct. 3, 1839. For the greater part of his active business life he was identified with the Morgan Iron Works, of which the late John Roach was chief owner. After the death of Mr. Roach he became president of the company and the connected Delaware Iron Shipbuilding & Engine Works at Chester, Pa. The controversy of this company with the Government over the acceptance of the cruiser Dolphin is well remembered. Mr. Weed was a charter member and vice-president of the Society of Naval Architects and Marine Engineers, and had been treasurer of the Engineers' Club for the past 17 years.

Gen. ELLIS SPEAR, formerly United States Commissioner of Patents, died April 3 in St. Petersburg, Fla., aged 83 years. He was born in Warren, Me., and graduated from Bowdoin College in 1858, served in the Civil War, rising to the rank of major and brevet brigadier-general, and became Commissioner of Patents in 1876. Two years later he resigned to engage in patent law practice in Washington.

HERMAN ERDMAN, general superintendent, G. A. Gray Planer Company, Cincinnati, died at his home in that city April 8, aged 66 years. He was a native of Germany, but came to this country when very young. At the time of his death he was a director of the Cincinnati Frog & Switch Company and also of the Casey & Hedges Company, Chattanooga, Tenn. He leaves his widow, two sons and one daughter.

GEORGE C. FISK, president of the Wagon Company, Springfield, Mass., car manufacturer, from 1871 to 1907, died April 6, aged 86 years. He became connected with the company in 1852 and continued with it until the firm was absorbed by the J. G. Brill Company in 1907.

CHARLES E. HAGUE, for the last nine years sales manager for the Terry Steam Turbine Company of Hartford, Conn., with offices in the Widener Building, Philadelphia, died April 9 at his home in the latter city, aged 52 years. He leaves his widow.

Inland Steel Buys Coking Coal Lands

The Inland Steel Company, Chicago, has purchased from the Indianola Coal Company, Pittsburgh, 2000 acres of coal land about 14 miles northeast of Pittsburgh. The ultimate expenditure by the Inland Steel Company will be about $2,000,000. Plans call for the building of a railroad spur, the sinking of a shaft and the establishment of a town. The coal mined will be used to supply the company's 130 coke ovens, none of the product being put on the market. The coal property will be operated under the old name. It was partly for the purpose of acquiring this property that the Inland Steel Company recently obtained a Delaware charter.

Chain Prices Again Advance

Effective Wednesday, April 4, prices on chain were again advanced $10 per ton. Prices now in effect on common proof-coil wire are as follows: 3/16-in., $11.10; ¼-in., $8.55; 5/16-in., $7.55; ⅜-in., $7; 7/16-in., $6.85; ½ and 9/16-in., $6.70; ⅝ and 11/16-in., $6.60; ¾ and 13/16-in., $6.50; ⅞ and 15/16-in., $6.40; 1-in., $6.30; 1-1/16, 1⅛ and 1¼-in., $6.40. The extras are as follows: 3/16 and ¼-in., B. B., $1.50 extra; 3/16 and ¼-in., B. B. B., $2 extra; 5/16 and larger, B. B., $1.25 extra, and 5/16-in. and larger, B. B. B., $1.75 extra. Makers continue to report the new demand heavy, with their output sold up for three to four months.

The Hopes Combustion Engineering Corporation, Glens Falls, N. Y., is making extensions to its foundry buildings and is installing an electric arc furnace for the manufacture of steel castings.

Machinery Markets and News of the Works

WAR NEEDS TO THE FORE

Government's Demands Multiply Daily

Domestic Trade Not Halted by War Move—Shipyards Buying—Second-hand Tools Less Plentiful—Export Trade Tapers Off

The Government's war demands day by day force themselves to a more commanding position before the machinery trade. Manufacturers and dealers are everywhere giving their undivided attention to these requirements. Munition plants which were awarded contracts for the army or navy or were assured of receiving them have already been in the market for equipment to adapt their shops to the new work. In some cities, such as Dayton, Ohio, companies are patriotically holding their munition workers together in anticipation of the nation's needs. Factories making fighting equipment aside from ordnance, especially aeroplanes, wireless telegraph instruments, range finders, etc., are being virtually taken over, enlarged and equipped for forced production.

The Brooklyn Navy Yard is buying from a large list of tools. At Cleveland the Government has purchased 13 traveling cranes. It also has a lot of business pending at Cincinnati, but up to the first of this week the war impetus had not been felt at Chicago.

War developments have not halted the steady flow of domestic orders, price advances being a more potent factor in holding up any business that has been delayed. A large part of the orders at New York are from large jobbing machine shops. Small lots of tools for quick shipment are sought in good volume by steel plants.

Shipbuilders have lately bought heavily of large sized planers, lathes, milling machines, boring mills, pneumatic tools, cranes and hoists.

The quantities of second-hand tools that were a considerable factor in the trade in recent weeks have to a large extent been cut down. Not much of this class of equipment is now available at Chicago.

Export business is quieting down everywhere, but some nice orders are taken every now and then, particularly for Russia and France.

New York

NEW YORK, N. Y., April 11, 1917.

Government activity is coming to the front in the local machine-tool market. A considerable list has been issued for the Brooklyn Navy Yard and the attention of the trade is being concentrated upon it. Aeroplane, wireless telegraph and other plants have been virtually taken over for war purposes. Additions to them have in some cases been put up almost over night, and in others will be undertaken immediately. Government orders have already been given in many cases with instructions to rush the work at the sacrifice of any other current business. While the shipbuilding plants apparently have not yet been requisitioned, they have placed numerous inquiries for equipment. Some of the larger munition makers who are reasonably certain to secure United States Government contracts have already placed their requirements for machine tools to handle this work with local dealers. In some shops this equipment will be apart from contracts that are now in hand, and in other shops it is aimed to adapt the shop to the new requirements by adding special units wherever necessary. In the case of those who are assured of such work, preliminary negotiations with prospective sub-contractors have already taken place and they in turn have placed their requirements with local houses.

Business has apparently not been affected by the actual formal declaration of war, except by perhaps a tendency to withhold orders, but not noticeably so. Inquiries are undiminished and quite general in scope. Much of the trade consists of single machines or small lots from the large jobbing machine shops. The call for milling machines, radial drills and planers is undiminished. Local companies dealing largely with the railroads find that present business is less than any time since before the war started, and no indication is given that the railroads are ready to buy now. In one case a large system has changed its policy from the time-honored criterion of railroad buying—the price—and will henceforth purchase equipment solely with the object of keeping its operating and rolling stock at highest efficiency on the principle adhered to by first-class manufacturers. Some activity is noticed in New England, with the buying confined for the most part to manufacturing concerns. Structural shops there are very slack. Shoe manufacturers who buy quantities of special punches, etc., are now practically out of the market due to impending labor troubles.

The General Electric Company, Schenectady, is inquiring for about 12 cranes of 10, 30, 40 and 50-ton capacities, for its home plant. Westinghouse Church Kerr & Co., Inc., has purchased three cranes for the Buffalo, Rochester and Pittsburgh shops at Rochester, N. Y. The Newport News Shipbuilding & Dry Dock Company, Newport News, Va., has placed an order for 57 electric hoists. The following purchases of overhead electric traveling cranes were recently made: The American Brass Company, Waterbury, Conn., one; the United States Aluminum Company, New Kensington, Pa., one; and the Warren Foundry & Machine Company, Phillipsburg, N. J., three.

The Delta Shipbuilding & Dry Dock Company, Box 346 Wilmington, Del., is in the market for about 25 shipbuilding tools aggregating over $100,000 in value. The list includes four plate planing and rolling machines, five punches, five shears, five special punches and about five other special units.

Activity at the Fore River Shipbuilding Corporation, Quincy, Mass., is at concert pitch. Work on the new shipways is being rushed jointly by the Aberthaw Construction Company and the Boston Bridge Works. It has purchased one 50-ton electric crane and also four 10-ton electric cranes for its new shipways.

The Marconi Wireless Telegraph Company of America, Roselle, N. J., will devote its plant at Aldene, N. J., entirely to Government orders. Large additions are to be constructed and the company has issued a good-sized list of machine tools, totaling in value over $50,000 for equipping them.

Export business is quieting down, except that inquiry from Russia seems to keep up in spite of everything. Some sales are being made also to Italy and France. Competition for foreign orders is noticeably much keener in the past few weeks. Specifications are confined now for the most part to standard machines. Orders from abroad for special machinery are becoming more numerous. One manufacturer of hydraulic machinery has recently received orders for macaroni presses, which have never before been built in this country.

The Atlantic Metals & Alloys Company, 21 Park Row, New York, incorporated last September with a capital stock of $20,000, has established a plant at Boonton, N. J., equipped with four electric furnaces of special design for the production of ferromolybdenum. H. Carey Morgan is president; Morgan Belmont is vice-president and Edward Rice is secretary and treasurer.

The Miller Foundry & Specialty Company, North Tonawanda, N. Y., has leased the former White Steam Laundry building and will move its plant from Goundry Street to the new location next month.

The American Ammunition Company, Bordentown, N. J., is arranging for the immediate operation of its plant at full capacity for the manufacture of time fuses. The company is reported to have received a large contract from the Government.

The Eaton Engineering Corporation, Sag Harbor, N. Y., has been incorporated with a capital stock of $125,000 to manufacture combustion motors. W. Ferguson, M. F. Andre and P. Eaton are the incorporators.

The Crouse-Hinds Company, Syracuse, N. Y., has let contracts for a cupola addition to its foundry, 32 x 33 ft.

The Cawley Glare Control Company, Buffalo, capitalized at $100,000, has been incorporated to manufacture an automobile-light controlling device. W. J. Reddington, 116 Bedford Avenue; W. L. Hock, 90 Goodrich Street, and R. E. Kirby, 913 Ellicott Street, are the incorporators.

The Co-operative Foundry Company, Rochester, N. Y., has let contract for the construction of boiler house, 48 x 72 ft., one story.

The Barber Asphalt Paving Company, Buffalo, has had plans drawn for an addition, 48 x 68 ft., to its machine shop at Walden Avenue and the New York Central Railroad Belt Line.

The Power Specialty Company, Dansville, N. Y., has let contract for an addition, 60 x 100 ft.

The Monarch Furniture Company, Jamestown, N. Y., has been incorporated with a capital stock of $50,000 for the manufacture of furniture. O. E. and F. O. Anderson, 122 Foote Avenue, and M. J. Norquist are the incorporators.

The MacIntosh-Seymour Company, Auburn, N. Y., has let contract for an addition, 180 x 190 ft., one story, to be made to its erecting shop. A. C. Baldwin is manager.

The Bradney Machine Company, Middletown, N. Y., has been incorporated to manufacture motors, machinery, etc., and operate a general machine shop. The capital stock is $107,500. T. Watts, J. Bright and E. N. Pakes, 4 East Main Street, are the incorporators.

The Syracuse Malleable Iron Works, Syracuse, N. Y., has let contract for a one-story addition, 87 x 183 ft., to its foundry.

The Black Reversible Engine Company, Wellsville, N. Y., has been incorporated to manufacture engines, machinery and factory supplies. E. C. Harder, C. M. Barnes and A. Root are the incorporators.

The Maas & Waldstein Company, Newark, N. J., manufacturer of chemicals, will build two one-story additions, each 30 x 100 ft., on Avenue R, to be used as a machine shop and wood-working plant, respectively.

The Higrade Belting & Weaving Company, Newark, N. J., has purchased property, 200 x 400 ft., at Niagara and Dresden streets, for a plant of 75,000 sq. ft. floor area for the manufacture of belting.

The Royal Mfg. Company, 43 Clinton Street, Newark, N. J., has been organized to operate a plant for the manufacture of automobile specialties. W. A. Goldsmith, 69 Court Street, is president.

The Hanson & Van Winkle Company, Newark, N. J., manufacturer of chemicals, dynamos and other products, will build a one-story brick addition to its foundry at 321 Chestnut Street, 40 x 40 ft.

The Newark Auto Parts Company, 473-77 Washington Street, Newark, N. J., has been organized to operate a plant for the production of special automobile parts. Joseph Amato, 28 Prospect Place, is active in the company.

Jeremiah Camfield, 33 Glorieux Street, Irvington, N. J., has filed plans for a foundry building to cost about $7,000.

The Lionel Mfg. Company, Irvington, N. J., manufacturer of electric toys, will build a two-story, brick addition, 77 x 82 ft., to cost $16,000.

The Irvington Tool Company, 52 Grove Terrace, Irvington, N. J., has filed registration of its organization to manufacture hardware specialties. Frank Selike is president.

The Texas Company, 17 Battery Place, New York City, has acquired about 69 acres at Port Newark, N. J., and is reported planning an oil refining plant to cost about $250,000.

The Delagrave Company, East Orange, N. J., has been incorporated with a capital of $50,000 to manufacture copper rollers for engravers' use and similar products. H. H. Picking and C. O. Geyer are the incorporators.

The Domestic Tungsten Lamp Company, 275 Bergenline Avenue, West New York, N. J., has acquired property, 50 x 100 ft., on Tenth Street for extensions.

The Electric Lamp & Products Company, 513 Paterson Plank Road, Jersey City, N. J., has been incorporated with a capital of $40,000 to manufacture electric lamps and kindred products. A. W. Britton, H. B. Davis and S. B. Howard are the incorporators. W. Kauffmann is local representative.

The E. C. Klipstein & Sons Company, Chrome, N. J., manufacturer of chemicals, has increased its capital from $100,000 to $1,000,000.

The Lamaco Chemical Company, Ridgewood, N. J., has been incorporated with a capital stock of $100,000 to establish a plant near Paterson for the manufacture of artificial leather. Lawrence J. Cohn, Ridgewood, is president.

Locke & Co., 218 West Eighty-fourth Street, New York, manufacturers of automobile bodies, have acquired property at Fifty-sixth Street and Avenue A for the erection of a four-story plant, 65 x 180 ft., to cost $100,000.

The American Agricultural Chemical Company, 2 Rector Street, New York, is reported to be considering sites at Syracuse for a new branch plant.

Philadelphia

PHILADELPHIA, PA., April 9, 1917.

The Navy Department has announced that of the $18,000,000 appropriation for the equipment of Government navy yards, about $6,000,000 will be used for the League Island Navy Yard, Philadelphia. The proposed plans provide for the erection of a series of new shop buildings for ship construction. The Maryland Dredging & Contracting Company, Baltimore, Md., has been awarded contract by the Navy Department for the construction of the new drydock at the navy yard. It will be the largest in America, and will cost about $3,000,000. It will be 1100 ft. long, 200 ft. wide and 80 ft. deep.

S. G. Matthews & Co., engineers and contractors for structural steel and ornamental iron work, 916-932 North Ninth Street, Philadelphia, are starting the construction of a one and two-story steel fabricating shop, 40 x 112 ft., of brick and steel, to be equipped with machinery for the general fabrication of structural steel and ornamental iron work. A Pels beam shear has been secured and the punching and shearing machinery is now being manufactured by the Royersford Foundry & Machine Company. Orders have not yet been placed for air compressors, chain hoists, pneumatic riveters, etc. Work will be started on the building at once. Electric current power for the Philadelphia Electric Company's lines, at 220 volts, two-phase, 60 cycles, will be used. All machinery will be direct driven.

The Monitor Bi-Loop Radiator Company, Lancaster, Pa., plans shortly to enlarge its machine shop and erect a new building for the core department. F. J. Vaux is vice-president and general manager.

The Hunter Pressed Steel Company, Orthodox and Horrocks streets, Philadelphia, is in the market for an Acme nut tapper.

The Hermance Machine Company, Williamsport, Pa., is seeking a planing machine, about 5 ft. x 38 in. x 10 ft.

The Kutztown Foundry & Machine Company, 1421 Chestnut Street, Philadelphia, is seeking a 91-in. diameter shell foundry cupola with suitable blower, also a first-class direct-connected engine and generator of 250 to 300 kw. rating, for a 220 to 250 volt direct current. It will purchase one 10-ton crane for 58-ft. 10-in. span, one 5-ton crane for 32-ft. 1-in. span and one 7-ton crane for 66-ft. 11-in. span, with headroom of 3 ft. from rails to truss, all three to operate on 220-volt current.

The American Metal Works, 314 Armat Street, Philadelphia, is having plans prepared for a two-story brick and concrete addition, 60 x 320 ft., to its plant at Germantown. Kern Dodge, 1512 Morris Building, Philadelphia, is the engineer. Bids will be taken up to April 15.

The Renno-Leslie Motor Company, Philadelphia, has been incorporated in Delaware with capital of $750,000 to manufacture automobiles and farm tractors. J. William Hills, Jr., Clarence H. Reed and William L. Connor, Philadelphia, are the incorporators.

The Philadelphia & Reading Railroad, Philadelphia, has awarded a contract for the erection of a new power plant and engine house at its Rutherford shops to cost $50,000.

The American Brake Lining Company, Philadelphia, has been incorporated in Delaware with a capital of $10,000, to manufacture automobile brake bands, lining, etc. William S. Jones and Harry E. Corrie, Philadelphia; and Howard Jones, North Wales, Pa., are the incorporators.

The Henry Disston & Sons File Company, Philadelphia, has received from Henry Disston & Sons, Inc., a tract of about two acres at Unruh and Wissinoming streets. It is reported that the property will be used for extensions.

The Budd Mfg. Company, Hunting Park Avenue, Philadelphia, manufacturer of automobile parts, has awarded a contract for a one-story brick addition to its machine shop, 120 x 175 ft., at Hunting Park and Wissahickon Avenues, to cost $55,000.

J. F. Handshuh & Co., Philadelphia, have been incorporated with a capital of $10,000, to operate a plant for the manufacture of electrical devices. Charles Handshuh is president.

The Schuylkill Forge Company, Philadelphia, will build a boiler plant addition to its works at North American and Pike Streets.

The Midvale Steel Company, Widener Building, Philadelphia, has awarded a contract for the erection of a two-story, reinforced-concrete addition, 18 x 56 ft., to its open-hearth building No. 3 at Nicetown, to cost $22,000. Barclay, White & Co., 1713 Sansom Street, are the contractors.

The David Lupton's Sons Company, Allegheny Avenue and Tulip Street, Philadelphia, manufacturer of steel sash and kindred products, has purchased property on Tulip and Ontario streets, 155 x 446 ft., which it is said will be used for extensions.

Isadore Martin, Philadelphia, and Edward E. Brent, Lawnside, N. J., have incorporated in Delaware the Eureka Electric Indicator Company, with a capital of $100,000, to manufacture electric signals and devices.

The Fort Mifflin Shipbuilding Company, Widener Building, Philadelphia, will soon call for bids for the erection of the initial buildings for its proposed shipbuilding plant at Marcus Hook. The structures will comprise machine shops, tool shops, blacksmith shop and shipbuilding berths. A. G. Steelman and C. L. Dambly are promoting the company.

Fire April 1 destroyed the three-story oil refining plant of the India Refining Company, Swanson and McKean streets, Philadelphia, with a reported loss of $200,000

The S. S. E. Automobile Company, 2300 Chestnut Street, Philadelphia, will build a one-story, brick and concrete addition to its factory at Erie Avenue and B Street.

The William R. Thropp Sons Company, Trenton, N. J., manufacturer of rubber mill machinery, will build a one-story machine shop on East State Street.

The C. V. Hill Company, 38 Bellevue Avenue, Trenton, N. J., manufacturer of refrigerators, has inaugurated a new department for the manufacture of bodies for automobile delivery trucks. Extensions will be made at the plant to provide increased capacity.

The John A. Roebling's Sons Company, Trenton, N. J., manufacturer of wire and wire rope, has filed plans for a new power plant addition on Canal Street to cost about $10,000.

The Joseph Pedrick Foundry Company, Camden, N. J., has acquired property at Twenty-first Street and Hayes Avenue, and will build a plant for the manufacture of boilers for house service.

A power plant, 60 x 80 ft., will be erected at the new factory of the McCausland Engineering Company, Fifth and Penn streets, Chester, Pa. The headquarters of the company are in the Pennsylvania Building, Philadelphia.

The Sun Shipbuilding Company, Chester, Pa., has awarded a contract for a one-story, concrete addition, 37 x 70 ft.

The Wilmot Engineering Company, Markle Bank Building, Hazleton, Pa., will build an addition to its plant at White Haven. The company specializes in the production of iron and steel castings.

The North American Motors Company, Pottstown, Pa., has awarded a contract for the erection of a one-story plant, 72 x 300 ft., on Queen Street, to form the first unit of its proposed works. Fred H. Keiser & Co., Pottstown, are the contractors.

The Industrial Foundry & Machine Company, Laurel and Washington streets, Pottstown, Pa., has filed articles of incorporation at Harrisburg. The company specializes in the manufacture of brass, bronze and aluminum castings for automobiles, aeroplanes, etc., and steam and valve fittings for furnace work, but not plumbers' supplies, as has been stated. It is now building an extension, 50 x 135 ft. J. H. Hoelgel is treasurer.

Fire April 2 destroyed the pattern storage shop of the Bethlehem Foundry and Machine Company, Bethlehem, Pa. No operating departments of the plant were interfered with.

Baltimore

BALTIMORE, MD., April 9, 1917.

The name of the Standard Welding & Cutting Company, Inc., 1307 Morton Street, Baltimore, has been changed to the Industrial Welding Company, Inc.

The business of the McShane Bell Foundry Company, Harford Avenue and Baltimore & Ohio Railroad, Baltimore, manufacturer of bells, chimes, steel, iron, brass and other metals has been incorporated with 1000 shares of preferred stock at $100 par value and 1000 shares of common stock without par value. The incorporators are Wilson M. Cary, Spencer W. Seery and Vernon Cook.

The Regenerative Evaporator Company, 710 North Carey Street, Baltimore, has been incorporated with $100,000 capital stock to manufacture evaporators, condensers, heaters, coolers and other appliances. The incorporators are James B. Arthur, Howard B. Lyon and William W. Varney.

The capital stock of the Hull-Salmon Mfg. Company, 1828 Wilkens Avenue, Baltimore, manufacturer of safety appliances, has been increased from $3,500 to $100,000.

The John Waters Company, 23 East Center Street, Baltimore, has been awarded a contract for the construction of a four-story factory for the National Enameling & Stamping Company, 1901 Light Street.

The Maryland Dredging & Contracting Company, 1515 Fidelity Building, Baltimore, Frank A. Furst, president, has been awarded a contract for the construction of a drydock at League Island Navy Yard, Philadelphia, 200 x 1100 ft. and 80 ft. deep. It will be the largest in the country, and cost about $3,000,000. Work will begin immediately.

The National Steel Company, Havana, Cuba, a Delaware corporation, has filed notice of increase in its capital from $100,000 to $250,000.

The Roanoke Iron & Steel Company, Wilmington, Del., has been incorporated with a capital of $3,500,000 to manufacture iron and steel products. H. E. Latter, N. P. Coffin and C. M. Egner are the incorporators.

The Bond Bottle Sealing Company, Wilmington, Del., has filed plans for additions to its plant to cost about $30,000.

The Stewart Wire Wheel Corporation, Dover, Del., has been incorporated with a capital of $500,000 to manufacture wire wheels for automobiles. J. B. Bailey and Arthur J. Kingsbury, Dover, are the incorporators.

The Cage Engine Syndicate, Wilmington, Del., has been incorporated with a capital of $250,000 to manufacture machinery and combustion engines. George E. Townsend, Edward G. Cook and Julian C. Walker, Wilmington, are the incorporators.

New England

BOSTON, MASS., April 9, 1917.

The Coppus Engineering & Equipment Company, manufacturer of power plant equipment, Worcester, Mass., has purchased property formerly owned by the Hill Drier Company, on Park Avenue, consisting of about one acre with two four-story brick buildings containing about 30,000 sq. ft. of floor space, into which it will move to provide facilities for meeting the increased demand for its turbo forced-draft blowers. A new line will also be added to its business. In one building the lower floor will be devoted to the engine and boiler rooms and for the welfare of its employees. The lower floor in the other will be used exclusively as a testing laboratory. The remainder of the building will be devoted to manufacturing and office use. On a part of the vacant land the company plans to erect a gray iron foundry in addition to housing its present brass foundry.

The Morgan Mfg. Company, manufacturer of automobile hardware and motor necessities, Newport, R. I., is seeking a new location of about 20,000 sq. ft. of floor space, with room to expand and with available switching facilities. Electric power and gas or coal fuel for heating furnaces and welding are also necessities. Its entire plant, which inventories at about $90,000, will be removed to the new location, providing a weekly payroll of about $750. C. C. Nash is correspondence clerk.

The Abrasive Machine Tool Company, Providence, R. I., has been incorporated with a capital of $150,000 by Frank M., Norman D. and Calin G. MacLeod, 290 Irving Avenue, Providence, and Elmer E. Dawson, 28 Washington Avenue, Winthrop, Mass.

The Hendee Mfg. Company, Springfield, Mass., has awarded a contract for an addition, 66 x 105 ft., one story, with saw-tooth roof.

The Roxbury Screw & Gear Works, Sharon, Mass., has been incorporated with a capital of $6,000. John McKenzie is president; Frederick A. Heuser, Sharon, treasurer, and L. E. Heuser, a director.

The Franklin Electric Mfg. Company, Middletown, Conn., has had plans drawn and is asking bids for the erection of a new factory, 40 x 200 ft., four stories.

The Hopkins & Allen Machine Gun Company, Boston, Mass., has been incorporated with a capital of $500,000. The directors are Samuel Vaughan, president; Francis R. Boyd, 40 State Street, treasurer, and John Noble.

The Henry G. Thompson & Son Company, New Haven, Conn., will build a four-story factory to cost about $100,000.

The Stephen Richard Company, Southbridge, Mass., has been incorporated with a capital stock of $50,000 to manufacture cutlery and hardware. The directors are Stephen Richard, president; Joseph E. O'Shaughnessy, Southbridge, treasurer, and M. P. O'Shaughnessy.

The Ball & Socket Company, Cheshire, Conn., has awarded a contract for an addition, 40 x 120 ft., with ell, 40 x 60 ft., two stories.

Edwin E. Bartlett, manufacturer of arbor presses, has removed to Nashua, N. H., from 326 A Street, Boston. The new plant is a brick mill type plant of 30,000 sq. ft. of floor space with siding and other conveniences for rapid production.

Chicago

CHICAGO, ILL., April 9, 1917.

No large inquiries have come before the trade in the past week, but the general report from dealers is that activity in miscellaneous and scattered buying of tools is maintained at a satisfactory rate. The fact that the country was about to enter war apparently had less influence on purchasers than the fact that prices have been further advanced. Radial drills, boring mills and milling, shaping and grinding machines are scarce, while the demand remains especially good. In a general way the larger sizes and heavier types of tools are most sought for. The situation is one which makes for high prices in second-hand stock, of which not a great deal is available. So far, the trade in this section has not felt any stimulus from Government buying.

Deliveries are slightly better in some directions, for the reason that machines which dealers have had on order for several months are now coming through. Radial drilling machines, however, are not to be had inside of four months with some makers, and not until next fall with others. Boring mills are being quoted into next year.

Armour & Co. have closed against the large list of car repair equipment for which they inquired a few weeks ago.

The Geneva Foundry & Machine Co., Geneva, Ill., has awarded the contract for an addition, 75 x 145 ft., to its foundry at Illinois and Stevens streets. Work will be started immediately.

Bids will be received this week by Harold Holmes, architect, 30 North Michigan Avenue, Chicago, on a one and two-story addition, about 55 x 220 ft., to the factory of the W. D. Gibson Company, Clybourn Avenue and Willow Street, maker of steel springs. It will be of mill construction and cost about $90,000.

Plans have been completed by A. E. Colcord, architect, 117 North Dearborn Street, Chicago, for a three-story machine shop, 60 x 100 ft., at 7314 South Chicago Avenue, for the Bates Valve Bag Company, to cost $30,000.

The new foundry, 265 x 363 ft., which is to be built for the James A. Brady Foundry Company, 3501 South Ashland Avenue, Chicago, will be equipped with traveling cranes and will cost about $130,000. The general contract has been let to the E. W. Sproul Company, 1120 West Thirty-fifth Street.

Wilson & Co., Chicago, meat packers, have had plans drawn for a one-story boiler-room addition, 52 x 68 ft., to cost about $10,000.

The commanding officer of the Rock Island Arsenal, Rock Island, Ill., is having plans drawn for a central heating plant estimated to cost $150,000. It will be one story, 50 x 180 ft. Col. George W. Burr is commandant.

The Central Manufacturing District, care of John A. Spoor and Arthur G. Leonard, 38 South Dearborn Street, Chicago, has drawn plans for a power house and tunnels to cost $200,000. R. L. Vaniman, care of the United States Yards & Transit Company, Chicago, is the mechanical engineer.

Plans are being prepared for a one-story foundry for the Edward Valve Mfg. Company, East Chicago, Ill. William T. Branitzky is the architect.

The Western Electric Company has purchased an entire block of land in St. Paul, Minn., at a cost of about $50,000 and will erect thereon a one-story distributing warehouse and factory, 100 x 210 ft.

The Silvers Mfg. Company, Waterloo, Iowa, has been incorporated with Delaware charter and capital of $25,000, to manufacture a patented safety lock. Samuel Silvers, C. G. Holden and Hugh Graef, all of Waterloo, are the incorporators.

The Menometer Company, Chicago, has been incorporated in Delaware with capital of $100,000 to manufacture a patented metering device. Edward H. McElroy, Ludwig Wilson and John Anderson, Chicago, are the incorporators.

The Davenport Mfg. Company, manufacturer of baling presses, Davenport, Iowa, which has been operating two separate plants for the manufacture of its products, as well as contracting for several thousand more balers with the Bettendorf Car Company, will erect a large plant at a cost of about $100,000 to bring all its business together. Improved types of machinery for its special work will be installed. It is booking business at about the rate of 1000 balers per month. Its foreign business for 10 months of 1916 showed an increase of 45 per cent over the same period for 1915. Reed Lane is president and W. H. Martin is vice-president and general manager.

Milwaukee

MILWAUKEE, WIS., April 9, 1917.

Local machine-tool builders are getting further behind on deliveries, due to the insistent demand from domestic sources. The war crisis appears to have stimulated demand, as inquiries and bookings the past week have been of even larger volume than before. Tool builders have not been able to make the least headway in catching up on orders, although the car situation has improved. A feature of the metal-working industry is the demand for standard tools from garages and repair shops. In most cases, the repair-shop departments of garages seek equipment which will enable them to do a wide range of machine-shop work rather than merely motor car repairs. This is especially true of garages in smaller towns and cities. Besides being an excellent market for new machines, they absorb a large quantity of used tools.

The Milwaukee Corrugating Company, Milwaukee, manufacturer of corrugated sheet-metal goods, has engaged Klug & Smith, consulting engineers, Mack Block, to prepare plans for a one-story shop addition, 120 x 250 ft., of brick and steel, with sawtooth roof, at Thirty-sixth Avenue and Burnham Street. It will cost about $100,000 complete with equipment. A. J. Luedtke is secretary.

The Aluminum Castings Company, Cleveland, Ohio, has sold its foundry and shop group at Manitowoc, Wis., to the Aluminum Goods Mfg. Company, and will build a new plant costing about $250,000. Plans are being prepared for a foundry, 200 x 300 ft., and auxiliary structures, to be situated on a new site at the southern city limits of Manitowoc, to be ready for occupancy about Oct. 1. The present plant, which will be turned over to the Aluminum Goods Company at that time, is located at Franklin and Sixteenth streets and adjoins the purchaser's factory, with which it will be combined. The new foundry will use from 125 to 150 hp. in motors, and will employ between 350 and 400 men. Howard Emery is general manager at Manitowoc.

It is reported that the Valley Steel Company is being organized to build a plant in the Menominee Valley manufacturing district, Milwaukee. Plans are said to be in preparation, but further details are not obtainable. It is intimated, however, that officials of the Milwaukee Electric Railway & Light Company are interested.

The C. A. Shaler Company, Waupun, Wis., maker of vulcanizing apparatus, tire tools and accessories, will add two stories, 50 x 50 ft., to the present one-story nickel-plating shop.

The Wehr Steel Company, Milwaukee, has purchased a tract of eight acres adjacent to its present plant, to provide for future extensions. It is stated, however, that no new work is contemplated for at least six months. The foundry is located at Forty-fifth and Gordon avenues, West Allis. Henry W. Wehr is secretary.

The Economy Power Appliance Company, Tomah, Wis., has been incorporated with a capital stock of $10,000 by W. A. Lee, E. H. Manning and William B. Naylor.

The John McFarland Company, Rice Lake, Wis., has been incorporated with a capital stock of $10,000 to operate a machine shop. It has purchased the repair-shop business of the Rice Lake Motor Car Company, and will enlarge it. The owners of the new company are John McFarland, Walter J. Bliffert, W. H. McCarthy and Alfred C. Loose.

The Jenkins Machine Company, Sheboygan, Wis., maker of wood and metal-working machinery, is building a new enameling shop.

The Hercules Mfg. Company, Racine, Wis., has been incorporated with a capital stock of $50,000 by Laurence J. Berkeley, John M. Scott, and C. C. Gittings to manufacture forging machines and other metal-working machinery.

Hoffman & Schmauffer, Milwaukee, manufacturers of wood and metal patterns, are building a new shop on Fifty-sixth Street, near Greenfield Avenue, West Allis, to be ready May 15.

The Eslien Sheet Metal Works, Milwaukee, has increased its capital stock from $10,000 to $30,000 to accommodate increased business and future extensions.

The Jerome Kidder Mfg. Company, Poynette, Wis., manufacturer of surgical instruments, has passed to the exclusive possession of Milton Kidder, who has purchased the interest of his father, F. M. Kidder.

The department of public works, Milwaukee, is taking sealed proposals until 10.30 a. m. May 2 for furnishing and installing one pumping engine complete of 12,000,000 gal. per day capacity in the North Point pumping station of the municipal waterworks system. Fred G. Simmons is commissioner of public works.

The Lawson Aircraft Company, Green Bay, Wis., has

been incorporated with a capital stock of $50,000 to manufacture airplanes, engines, parts, accessories, etc. Alfred W. Lawson, formerly of Detroit, Mich., is the promoter and will be general manager.

Mount Horeb, Wis., plans a new high school to cost $75,000 and including a manual training department. E. P. Thompson is superintendent of schools.

The Northern Boiler & Structural Iron Works, Appleton, Wis., it is reported, has decided to postpone the erection of its shop addition, 60 x 140 ft., until the building-material market becomes settled. William Timm is president.

The Joerns Brothers Mfg. Company, Sheboygan, Wis., has decided to rebuild the cabinet and furniture plant, destroyed by fire with an estimated loss of $100,000 several weeks ago. Plans have not yet been prepared.

The Northwestern Motor Car Company, 1071 Twenty-ninth Street, Milwaukee, will build a two-story garage, 130 x 188 ft., at West Twenty-fourth Street and North Avenue, at a cost of $30,000. Herbst & Hufschmidt are the architects.

The Milwaukee Refrigerator Transit & Car Company, Milwaukee, is being reorganized as the Marsh Refrigerator Service Company, which has been incorporated in Wisconsin with a capital stock of $800,000. The company manufactures and leases refrigerator cars, operating a plant on the Port Washington Road, North Milwaukee. H. W. Marsh is vice-president, secretary and general manager.

Watertown, Wis., capital is negotiating with the Electric Steel Casting Company, Milwaukee, for the location of its foundry and headquarters in that city. Leo G. Smith is president and general manager of the company.

The Cutler-Hammer Mfg. Company, Milwaukee, maker of electrical controlling devices, will erect a six-story brick and reinforced concrete office, warehouse and manufacturing building, 60 x 283 ft., costing $250,000. This is the first unit of its extensive plant reconstruction scheme.

The Hummel & Downing Company, Milwaukee, manufacturer of paper and fiber boxes, has broken ground for buildings costing $600,000 to $700,000. The main improvement is a new paper mill, 100 x 320 ft., four stories and basement, and a power house, 86 x 100 ft., with equipment generating 3500 hp.

The Neenah Brass Works, Neenah, Wis., is contemplating the erection of an addition to its foundry which will increase the capacity 50 to 75 per cent. E. J. Hoffmann is manager.

The Washington Cutlery Company, Watertown, Wis., is contemplating an addition 54 x 60 ft., two stories and of brick construction.

Cleveland

CLEVELAND, OHIO, April 9, 1917.

The machinery market continues fairly active, although the volume of inquiries has fallen off somewhat. The most important transaction reported the past week was the purchase of about 18 machines, nearly all large tools, by the New York Central Railroad for its shops at Elkhart, Ind., which had been pending for some time. The Nickel Plate Railroad has not yet closed on its list recently sent out. A general tightening of the market, especially as regards the heavier types of machines, is expected as a result of the demand of the Government, directly or indirectly due to the war with Germany. One war inquiry that has come out in this territory is for a number of large machines for making gun forgings. Dealers report a good demand for small lots of machines, practically all of which are wanted for quick shipment. This business is coming largely from steel plants, fabricating shops and makers of automobile accessories. The demand for locomotive cranes, shop cranes and hoists is heavy. A good volume of business in pneumatic tools is coming from American shipyards, and also from Russia, Japan and Australia.

Government orders for 13 traveling cranes have been placed in the past few days. Six 15-ton cranes were taken by the Brown Hoisting Machinery Company, Cleveland, and two by the Browning Company, Cleveland, the remainder being distributed among other builders.

The Standard Steering Wheel Company, Cleveland, has been incorporated with a capital stock of $150,000 and will equip a plant for the manufacture of steering wheels, wood rims and spiders for motor vehicles and power boats. H. S. Edgerley is president. The company's present office is at 818 Citizens Building.

The Cleveland Wire Cloth & Mfg. Company, Cleveland, will enlarge its plant by the erection of a two-story factory building, 44 x 105 ft.

The W. S. Tyler Company, Cleveland, has taken out a permit for an addition to its plant for galvanizing purposes, estimated to cost $12,000.

The Akron Equipment Company, Akron, Ohio, has been incorporated with a capital stock of $125,000 by C. F. Schnee and others. It will erect a plant in East Akron for the manufacture of equipment to be used in rubber-manufacturing.

The Enterprise Mfg. Company, Akron, Ohio, plans the erection of a two-story factory building.

It is announced that the Pittsburgh Valve & Fitting Company will enlarge its plant at Barberton, Ohio, by the erection of a third story over its present shop.

The Reynolds Machine & Mfg. Company, Massillon, Ohio, which was recently organized to take over the plant of the Reynolds Pattern & Machine Company, Moline, Ill., announces that it will erect a two-story plant, 65 x 200 ft. Some additional machine-tool equipment will be required. The company has not yet decided what tools it will purchase, but they will be standard metal-working machines.

The Lock Washer Company, Mansfield, Ohio, recently organized, began operations a few days ago in its plant, formerly occupied by the Triumph Valve Company, to which an addition, 40 x 140 ft., has been erected. William H. Davey is president, and A. E. Witter is secretary and treasurer.

The Ohio Corrugating Company, Niles, Ohio, announces that it will build an addition to its plant and install considerable new equipment to care for the increase in its business. At the annual meeting a few days ago, W. Manning Kerr was re-elected president and treasurer; C. H. Reigel, vice-president and manager, and W. P. Reed, secretary.

The Hinde & Dauch Company, Sandusky, Ohio, has placed a contract with the Underpinning & Foundation Company, New York, for the construction of its three-story factory addition, 100 x 820 ft., of reinforced concrete and steel.

The Penn Mold & Mfg. Company, Dover, Ohio, has placed its new plant in operation for the manufacture of ingot molds.

The Chalmers Mfg. Company, Lima, Ohio, has been incorporated with a capital stock of $60,000 by Charles S. Brown, John M. Morgan and others to operate a foundry.

The Ohio Machine & Tool Company, Kenton, Ohio, will enlarge its plant by the erection of a brick and steel addition.

Detroit

DETROIT, MICH., April 9, 1917.

The declaration of war has caused practically no let-up in the local machine-tool trade, according to dealers. While a slight lull occurred for a few days last week, business immediately picked up and indications are that national affairs will not disturb the machinery markets other than in deliveries. Jobbers expect the war will stimulate the market instead of depressing it. Manufacturing plants are working to full capacity and automobile companies report the demand for parts is greater than can be filled. Brass products and automobile and plumbers' supplies are in heavy demand. Active operations in brass, copper, aluminum and grey iron are reported. Spring building is in full swing. Business conditions were never so prosperous as at present, notwithstanding the scarcity of raw material.

B. F. Robertson, formerly secretary and general manager of the Detroit Chair Mfg. Company, has secured control of the stock of the company held by Henry Kaiser, Leo Kaiser, Charles Schuknecht and Fred Bechold, in a reorganization of the company.

The Porter Body Company, Ypsilanti, Mich., is contemplating enlargements to its plants as the result of a large order for its product.

The Holihan Mfg. Company, Detroit, Mich., manufacturer of metal stampings for motors, has changed its name to the Motors Metal Mfg. Company. Charles R. Talbot is president, H. A. Burnett, vice-president, and William Christian, secretary, treasurer and general manager. The company is now occupying its new plant at Milford Avenue and the Pere Marquette Railroad.

The United States Radiator Corporation is preparing to resume manufacturing operations in its Detroit plant April 15, after being closed five years.

The Double Steel Tire Valve Company, manufacturer of automobile tire valves, formerly located in New York, has moved its business to Detroit. Plans have been drawn for a factory. J. Robert Wilkin and Thomas J. Walsh, both of Detroit, are respectively president and general manager.

The Lapeer Tractor Company, Lapeer, Mich., has organized with W. H. Tucker, president; Thomas White, vice-president; D. E. Mix, secretary, and Ray Carpenter, treasurer.

The Acason Motor Truck Company, Detroit, will build an addition to its plant, doubling or trebling the present floor space. R. G. Shuert, formerly connected with the Indiana Truck Company, took over the management of the factory March 1.

The Famous Truck Company, Inc., will erect a factory in St. Joseph, Mich. John F. Palmer, of the Palmer Tire & Rubber Company, has tendered the eastern portion of his

plant at St. Joseph to the company, until the completion of the new plant on which construction is to be started immediately. It plans to manufacture 5000 trucks per year.

It is reported that the Commonwealth Power Company, through its subsidiaries, is planning to spend approximately $10,000,000 for improvements and extensions during the present year in Michigan.

The Economy Baler Company, Ann Arbor, Mich., will add to its factory equipment and erect a new building to take care of the greater demand.

The new building of the Adrian Steel Castings Company, Adrian, Mich., which is being erected to replace the one destroyed by fire last summer, is nearing completion and it is expected operation will be resumed in a few days.

The Albion Casket Company, Albion, Mich., will shortly move to Lansing.

The Jordan & Steele Mfg. Company, Hastings, Mich., maker of plumbers' supplies, will remove to Charlotte, Mich., where it has purchased a site and will erect a building, 50 x 125 ft. It also manufactures a gravel loader.

The Armstrong Steel Spring Company is the present corporate style of the J. B. Armstrong Mfg. Company, Flint, Mich., not vice versa as has been stated.

The Langtry Machine & Tool Company, 700 Commonwealth Avenue, Detroit, Mich., has purchased the entire plant of the Michigan Standard Gear Company and is removing the stock and equipment to its own shop. When completed they will have 10,000 sq. ft. of floor space, equipped with a fine line of automatic screw machines, hand screw machines and gear cutters. It will make a specialty of automatic screw machine products, spur gears and sprockets.

Cincinnati

CINCINNATI, OHIO, April 9, 1917.

Numerous reports have been circulated as to the receipt of large war orders from the Government by different local and nearby manufacturers. An investigation shows that these reports are somewhat premature. Quite a lot of Government business is under negotiation, and one local firm has hopes of landing a large order for aeroplane motors, but the contract has not yet been formally awarded. Munition makers at Dayton, Ohio, some of whom have finished their foreign contracts, are endeavoring to hold their forces together in anticipation of orders from the Government.

The domestic call for machine tools continues very good, but the export demand shows some signs of letting up, although numbers of firms have orders on their books for machines that will take them several months to complete. Shipbuilding firms have lately bought heavily of large planers, lathes, milling machines and boring mills. Second-hand machine tools are not as plentiful as they were two or three weeks ago. Quite a number were recently put on the market by munition manufacturers, who had finished foreign contracts, but those unsold have now been withdrawn. Makers of electric generators and motors were never busier, as far as the smaller units are concerned. All the jobbing foundries are running on full time.

The Acme-Greaves Machine Tool Company, Cincinnati, has been incorporated with $1,000,000 capital stock by C. H. M. Atkins, William A. Greaves, B. B. Quillen, George Langen and A. J. Jones. It was formed to buy out the Acme Machine Tool Company and the Greaves-Klusman Tool Company. The organization of the new company has not yet been entirely completed, nor have the officers been selected.

The Steptoe Shaper Company, Cincinnati, is having plans prepared for an addition to its plant, 60 x 90 ft., one story, of brick construction. Nearly all equipment needed will be of the company's own manufacture, with the exception of a 25-hp. electric motor. Otto Broxtermann is president.

The Huenefeld Company, Cincinnati, is moving equipment into a large five-story addition to its plant on Spring Grove Avenue. All machinery has been purchased.

The Parker Roller Bearing Machine Company, Cincinnati, L. F. Parks, president, is constructing a two-story addition to its plant on Gordon Street, that will be used as an assembling department. The company manufactures portable wood-working machines and other specialties.

The new plant of the Carlton Machine Tool Company, Spring Grove Avenue, Cincinnati, is nearing completion and the necessary machinery will be installed at an early date.

The Monitor Stove & Range Company, Cincinnati, has let contract for an addition to its plant, 80 x 130 ft., two stories, of general factory construction.

The Nydia Bank Lock Company, Cincinnati, has increased its capital stock from $50,000 to $150,000. It will manufacture builders' hardware specialties.

The Joyce Cridland Company, Dayton, Ohio, manufacturer of hydraulic and lever jacks, has tentative plans under way for an addition to its plant.

The Kloepfer-Springfield Autophore Company, Springfield, Ohio, has been incorporated with $10,000 capital stock by George J. Kloepfer and others to manufacture a patented automobile specialty. Very little equipment will be required.

The Simplex Foundry Company, Columbus, Ohio, has commenced operating its new aluminum castings foundry on Spruce Street.

It is rumored that the Foster Gear Company, Columbus, Ohio, has tentative plans under way for a further addition to its plant. Details are not yet available.

The Chase-Greer Company, Columbus, Ohio, has been incorporated with $10,000 capital stock to manufacture a patented fuse box.

Work has begun on an extensive addition to the plant of the Ironton Malleable Foundry Company, Ironton, Ohio.

The Hoosier Iron Works Company, Kokomo, Ind., has begun operations in its new foundry on Webster Street.

The Jaeger Machine Company, Columbus, Ohio, has acquired a manufacturing building at Dublin and Michigan avenues, and will remove its plant on Scioto Street at an early date. The new building will enable the company to increase its manufacturing capacity.

Troy, Ohio, Frank Burkholder, director of public service, will open bids April 18 for the following equipment for its municipal lighting plant: One 500-kw. steam-driven generating unit complete. One 300-hp. boiler, complete. One mechanical stoker. One condensing unit for above generating outfit. One feed water heater, complete. One 25-kw. motor generator exciter set.

Indianapolis

INDIANAPOLIS, IND., April 9, 1917.

The Gould Motor & Mfg. Company, Marion, Ind., has been incorporated with a capital stock of $100,000 to manufacture a new type of gasoline engine. Among the incorporators are J. A. Hardman, O. M. Scarborough and Frank Barr.

The Peerless Foundry Company, Indianapolis, has increased its capital stock from $4,500 to $100,000.

The mills of the Hoadley Stone Company, Bloomington, Ind., recently burned, with a reported loss of $175,000, will be rebuilt.

S. F. Bowser & Co., manufacturers of tanks, Fort Wayne, Ind., have let contract for a new four-story office building to cost $350,000.

The Modern Refrigerator Company, Peru, Ind., will erect a new factory building.

The Revere Motor Car Company, Logansport, Ind., will erect a new factory building.

The Bultman Flexible Land Roller Company, Osgood, Ind., has been incorporated with $50,000 capital stock to manufacture land rollers. The directors are Harry Bultman, Oliver W. Bultman and W. M. Turner.

The Railway Motor Car Company, Marion, Ind., has changed its name to the Jaruth Mfg. Company.

The Rhinesmith-Simonson-Evans Company, Fort Wayne, Ind., has been incorporated with $80,000 capital stock to manufacture interior woodwork. The directors are Ira P. Evans, Robert D. Evans, Donald B. Evans, John B. Wagner and Herman Brandt.

The Goshen Electric Material Company, Goshen, Ind., recently incorporated, will not manufacture, but will do electrical jobbing and electrical supply business.

The Central South

LOUISVILLE, KY., April 9, 1917.

Local trades view the prospects of business on a war time basis without apprehension, according to responses of those canvassed. Manufacturers of boilers and power equipment are working to capacity with orders booked far ahead and supplies contracted for, while distributors are selling the more important items for future delivery. There is no local congestion of freight traffic but the car supply, though easier than heretofore, is not satisfactory. One local manufacturer, for instance, is shipping on flat cars which it covers with a waterproof, fireproof cover made in its own plant.

The Lenoir City Car Works, Lenoir City, Tenn., is installing a plant for manufacturing gray steel malleable castings. A brick stack 100 ft. high has been completed and the erection of a two-story brick building, 50 x 180 ft., in which will be installed a malleable iron castings plant, is under way. This will be completed within two months at a cost of about

$20,000. These additions will enable the company to make practically all of its castings. George S. Evans is superintendent.

The Southern Machinery Exchange, Lexington, Ky., is asking for dealers' prices on a 70-hp. fire-box or horizontal tubular boiler, 125 lb. pressure.

Truman Drury, Morganfield, Ky., is asking for information and prices on a centrifugal pump, operated by kerosene engine and capable of raising 100,000 gal. of water per day three feet.

The John G. Duncan Company, Knoxville, Tenn., is in the market for good, second-hand vertical boilers of 20, 25 and 30-hp.; also locomotive or Scotch marine boilers of the same horsepower.

Texas

AUSTIN, TEX., April 7, 1917.

The Lone Star Shipbuilding Company, Beaumont, will soon let the contract for constructing a shipbuilding plant which will cost, when all the units are completed, about $2,000,000. George B. Leighton, Boston, is president.

The Woodville Light & Power Company, Woodville, will install machinery for an electric light and power plant. J. M. Williams is a stockholder.

The Exporters & Traders Compress Company, Hillsboro, will rebuild its cotton compress, recently destroyed by fire. The new plant will cost about $75,000.

The Gulf Fish Oil & Fertilizer Company, Galveston, which has been incorporated with a capital stock of $50,000, will install a plant for the manufacture of oil and fertilizer from fish. J. W. Nunn is a stockholder.

The Donna Light & Power Company, Donna, incorporated with a capital stock of $5,000, will install an electric light and power plant.

St. Louis

ST. LOUIS, MO., April 9, 1917.

The national situation the past week had a deterrent effect upon business and dealers have not closed many new transactions for equipment. It is expected that the call for munitions equipment will again delay deliveries, not only of machinery already ordered, but more probably future machine-tool orders. Business conditions generally, while showing some hesitancy, are still at a high level.

The Ideal Machine & Tool Works, St. Louis, has leased quarters at 22 South Broadway to manufacture machinery.

The Chamber of Commerce, St. Louis, is negotiating with a motor truck company which will install in its plant when located in St. Louis about 15 lathes and other mechanical equipment.

The Biard Pneumatic Tool Company, Kansas City, Mo., has been incorporated with a capital stock of $250,000 by F. W. Lukins, A. M. Biard and J. F. Haskell to manufacture metal-working tools.

McGehee, Ark., will add a 120-hp. crude-oil engine, Diesel type, a 100-kw. alternating current generator and other equipment at its electric light plant. H. W. Wright is general manager.

The Rockwell Mfg. Company, Camden, Ark., will re-equip its wood-working plant recently burned with a reported loss of $250,000 and is in the market for the necessary machinery. B. C. Rockwell is manager.

Butler, Okla., has voted $6,000 for additional electric light plant machinery.

The Greater Gas, Oil & Refining Company, Ada, Okla., has been incorporated with a capital stock of $600,000 by H. S. Gutxhes, James E. Webb and others.

The Atlantic Petroleum Company, Tulsa, Okla., has undertaken the development of about 80,000 acres of oil lands and is installing equipment with plans to purchase more. It has a capital stock of $7,000,000. H. N. Gries is president.

C. H. Blakney, Hugo, Okla., will equip a garage, requiring about $8,500 of machinery.

The Scott Motor Company, Tulsa, Okla., incorporated by W. A. and S. H. Scott and L. J. Turner, is in the market for machinery for a repair shop.

The Mississippi State Penitentiary, J. J. Coman secretary, Jackson, Miss., is in the market for a cotton gin equipment, including boiler and engine, etc. Saw and shingle-mill equipment is also wanted.

The Bellgrade Lumber Company, Louise, Miss., with headquarters at Memphis, Tenn., will equip a plant with a daily capacity of 50,000 ft. W. C. O'Briant, Memphis, Tenn., has the specifications.

Henry Piaggio, Gulfport, Miss., has plans for a shipyard and is in the market for wood-working machinery.

The Stevens Foundry & Machine Company, New Orleans, La., will equip a plant requiring about $20,000 worth of machinery, etc.

The C. H. Wisner Cotton Picker Company, New Orleans, La., has been incorporated with a capital stock of $1,000,000 by William Henderson, W. B. Thompson, Frank B. Hayne and William Edenborn and others to manufacture a machine to pick cotton.

The Glenmora Light & Power Company, Glenmora, La., will install new equipment including a crude oil engine, additional motors and generators and also a water pump. F. P. Joseph is manager.

Morris & Co., Union Stock Yards, Chicago, Ill., will not erect a meat packing plant at Fort Worth, Tex., as has been stated. They have purchased the New Orleans stock yards and contemplate the erection of a large plant at that point.

Catalogs Wanted

The St. Louis Machine Tool Company, 2607 South Broadway, St. Louis, Mo., plans the construction of a plant this spring for the manufacture of tapping machines and chucks, grinding and polishing machines. It will be pleased to receive catalogs of materials, equipment and conveniences used in such a plant.

The Pacific Coast

SAN FRANCISCO, CAL., April 4, 1917.

The Pacific coast machine-tool trade continues rather quiet, buyers preferring to wait until something more definite is known concerning international developments. Most houses, however, report more business than for the preceding month. Small tool business is especially good and a number of lines have made advances, which have been readily absorbed by the trade. Some foreign inquiries, principally from Japan for machine tools, have been noted in this market and a bigger business than ever before is being enjoyed with the Pacific island possessions. Mining firms are in the market now for new supplies and hauling conditions to the mines have improved. Railroad work continues a large factor in the present situation and shipbuilding yards are, if possible, busier than they were last month.

The late spring throughout the Pacific Northwest and eastern parts of Oregon and Washington has resulted in an unexpectedly heavy demand for tractors and farm equipment; in fact, considerably heavier than the supply on hand. Both new and second-hand machinery is in demand for canneries and fruit-manufacturing plants. The salmon canning industry in Alaska has drawn heavily on the supplies of machinery houses, and dealers report an unusually busy spring season.

The building of wooden ships is showing a remarkable increase, and a large part of the material will come from the Pacific coast mills. The effect of this shipbuilding has already been felt, and some of the larger mills are working almost exclusively on such orders. Demand for lumber from Alaska is unusually heavy, and several big shipments have recently been made for the Alaska Engineering Commission. As the railroad work progresses and new territory is opened, the demand is increasing for lumber for construction activities. Interior mills report exceptionally heavy orders, with only the drawback of inability to secure cars.

The C. L. Best Gas Traction Company, San Leandro, Cal., is to expand its plant, and will install more than $150,000 worth of new machinery. C. A. Hawkins, formerly connected with the White Company, Cleveland, Ohio, has purchased an interest in the company and will also establish a tractor factory at Cleveland.

The Union Iron Works, San Francisco, has purchased a 95-acre site on the east side of San Francisco Bay and will install boiler, blacksmith and pattern shops and foundries.

T. Hirano, adviser of the Kobe Steel Works, Kobe, Japan, is in San Francisco, and it is stated plans to purchase machinery for fitting out rolling mills and five munition factories.

The Pacific Coast Shipbuilding Corporation has bought a site at Alviso, Cal., on the southern end of San Francisco Bay and will build a plant to cost $50,000. Wood-working shops will be installed.

The Triumph Compound Engine Company, San Francisco, has been incorporated with a capital stock of $1,250,000 by W. N. Hobart, L. A. Maddox, J. C. Hobart, J. H. Eickershoff and T. M. Hinkle.

The Santa Fe Company is to construct a new power plant and blacksmith shop at San Bernardino, Cal. A new boiler repair shop is already being built.

The Arizona Machinery Mfg. Company, Phoenix, Ariz., has succeeded the Machinery & Electric Company and the

Five Points Auto Supply Company. New machine-tool equipment will be installed at once.

J. Hooper, San Francisco, is to spend $11,000 on new equipment for his machine shop on Bush Street.

The Pacific Steel & Copper Plate Company, San Francisco, has been authorized to sell 195 shares at par to net the company $100 per share; the money is to be used to purchase machinery.

J. W. Hansbrough has bought 52 acres of water front land at Vallejo, Cal., and will erect shipbuilding yards. Five building ways and extensive wood-working shops will be installed.

The Capital Art Metal Company, San Francisco, has taken over the factory at Richmond, Cal., formerly occupied by the Sterling Fixture Company. New machinery for making steel furniture is to be installed.

The Southern Pacific Railroad is completing plans for a roundhouse and repair shop to be erected at Fresno, Cal., at a cost of $500,000.

The Nevada Legislature has granted a franchise to Walter E. Trent, Reno, to build a railroad 175 miles in length to run from Ely to Tonopah. It is to serve a smelter, which he is to build at Tybo, Nev., with a capacity of 500 tons per day. The railroad and smelter will cost about $4,000,000.

The Rooney-Wyckoff Company, Los Angeles, has been incorporated with a capital stock of $50,000 by J. H. Rooney, B. F. Wyckoff and L. Schenck. It will construct a foundry and machine shop at San Pedro, Cal.

John F. Craig, Long Beach, Cal., has acquired a site on the waterfront for his proposed shipbuilding plant at Water Street and Harbor Channel No. 3, and has filed plans for a machine shop. The property has a frontage of about 1000 ft. The equipment will include forming and patternmaking machinery, drill presses and lathes.

The Republic Motor Truck Company, Alma, Mich., is reported to be planning the erection of an assembling plant near Los Angeles, Cal. Negotiations are under way for a site of three or four acres.

The Wilmington Canning Company, Wilmington, Los Angeles, has announced that future operations of the company include the construction of a shipbuilding plant. It has secured about 150 acres and has appropriated $500,000 for expansion in 1918.

J. P. Clark, Los Angeles, and Henry M. Coit and George W. Bush, San Diego, are organizing a company to operate a shipbuilding and repair works at San Diego. A site on the city tidelands, about 200 x 285 ft., has been secured.

The Pacific Steel & Boiler Company, Tacoma, Wash., plans a second addition to its plant within a year. It will be 60 x 135 ft., and equipment will be installed to double the present capacity. O. T. Nelson and A. H. Chrisman are the owners. The company's Seattle office has been moved to the L. C. Smith Building.

A new company is being formed to construct a plant on the Columbia River, near Portland, for the building of all-steel motor boats. The company will be known as the Columbia Transportation System, and will be incorporated for $1,000,000. The first expenditure will total $200,000 and will provide for construction of 20 boats. A production of 300 boats is planned. Wallace R. Struble, secretary of the Columbia & Snake River Waterways Association, Portland, will be one of the incorporators.

The Pacific Metal & Galvanizing Company, 839 Henry Building, Seattle, Wash., plans the construction of a galvanizing plant on the waterfront, to have capacity of 5000 tons per year. The first unit will consist of complete equipment for galvanizing metal by the hot dip process. C. B. Rhodes is president.

Whalen Brothers, Port Angeles, Wash., plan the construction of a paper mill in that city, to cost $1,800,000. The main building will be 1480 ft. long, three stories, of reinforced concrete. A sawmill will also be erected. The headquarters of the firm remain at Vancouver, B. C. T. T. Aldwell is their Port Angeles agent.

Portland, Ore., is considering a plan of W. H. Daly, commissioner of public utilities, for a steam electric plant to cost $350,000, preliminary to the development of its proposed hydroelectric development in the Bull Run Reserve.

The Settlers Irrigation District is to be formed near Twin Falls, Idaho, for the irrigation of 24,000 acres of land. The proposed power plant and system to be constructed will cost $700,000. J. H. Burkett, engineer, Twin Falls, will prepare plans.

Two new shipbuilding plants will be established in Seattle immediately for the construction of wooden ships, one by the National Shipbuilding Company, and the other by the International Shipbuilders, Inc. The latter concern is capitalized for $500,000, paid up, and was incorporated by George W. Ninemire, Montesano, Judge L. F. Chester, Seattle; I. M. Howell, Secretary of State, Olympia; Robert M. Cavette, Seattle, and W. S. Badley, Pendleton, Ore. Both plants will be located on the Duwamish Waterway and will specialize in large auxiliary-powered wooden hull schooners and in submarine chasers. The National Shipbuilding Company has been reorganized with a capital of $2,000,000 by William J. Fisher, Tacoma; George A. Lee, Seattle, and Judge Zent of Spokane.

Canada

TORONTO, ONT., April 9, 1917.

The McClary Mfg. Company, London, Ont., manufacturer of stoves, furnaces, etc., will build an addition to its factory to cost $40,000, to be three stories, of brick construction. W. M. Gartshore is manager.

The Chicago Bridge & Iron Works, Ltd., Bridgeburg, Ont., has decided to build an addition to its plant there.

The British Cordite Company is erecting a large plant at Nobel, Ont., for the Imperial Munitions Board of Ottawa, Ont.

The Russell Motor Car Company, King & Duncan streets, Toronto, has been granted concessions in York Township, Ont., and will erect a plant there for the manufacture of skates, bicycles, etc.

The Montreal Locomotive Company, Montreal, has had plans prepared and will erect additions to its plant.

The Hull Iron & Steel Foundries, Ltd., Hull, Que., it is reported, will spend $500,000 on additions to its plant.

The Dominion Aircraft & Mfg. Company, Montreal, is having plans prepared for a plant to cost $200,000. W. H. Parker is manager.

Fort Erie, Ont., proposes to build an electric plant, construction work to start next June. George Ross, Welland, Ont., is the engineer.

The Montreal Box Board Company, Basin Street, Montreal, will build an addition to its factory to cost $20,000.

The Quaker Oats Company, Chicago, Ill., proposes to build a factory at Saskatoon, Sask., including a plant for manufacturing coal gas for the factory. Machinery will be required.

Rapid progress is being made on the erection of the new plant for the Canadian Aeroplanes, Ltd., on Dufferin Street, Toronto, to cost $500,000.

The Dominion Steel Foundry Company, Depew Street, Hamilton, Ont., has started the erection of an addition to its plant to cost $27,000.

The Port Arthur Pulp & Paper Company, Ltd., Port Arthur, Ont., has been incorporated with a capital stock of $2,000,000 by George H. Sedgewick, 17 Poplar Plains Road; James Aitchison, 6 Thornburn Avenue; Duncan McArthur, and others, all of Toronto. The company has awarded the contract to J. F. Hewitson, Port Arthur, for the construction of buildings to cost $350,000. It is reported that the plant when completed will cost $1,000,000.

The Bawden Pump Company, Ltd., Toronto, has been incorporated with a capital stock of $40,000 by George H. Sedgewick, 17 Poplar Plains Road; Duncan McArthur, Archibald T. Struthers and others.

The Chevrolet Motor Company of Canada, Ltd., Oshawa, Ont., has increased its capital stock from $500,000 to $1,500,000.

Lion Locks, Ltd., Toronto, has been incorporated with a capital stock of $50,000 by Aubrey T. Maher, 344 Jarvis Street; John B. O'Brien, John S. Duggan, 6 Adelaide Street East, and others, to manufacture automobile locking devices, safes, vaults, etc.

The Grain Growers' Grain Company, Winnipeg, Man., proposes to build a lumber mill of 20,000,000 ft. per year capacity, to cost $150,000.

The plant of the Echo Milling Company, Gladstone, Manitoba, was totally destroyed by fire April 1, with a reported loss of $115,000.

The J. P. Quinlan Mfg. Company, North Bay, Ont., will build a plant there for the manufacture of furniture, school fittings, etc.

The Hesco Company, manufacturer of electric supplies, 210 Adelaide Street West, Toronto, is in the market for a No. 3 metal stamping press.

The Cameron Lumber Company, Ltd., has secured a lease of the mill of the Canadian Puget Sound Lumber Company at Puget Sound, B. C., for four months with a renewal option of six months more. The plant will be put in order for the manufacture of munitions boxes for the Imperial Government.

The Norton Company, Chippewa, Ont., has plans under way for the enlargement of its plant.

Government Purchases

WASHINGTON, D. C., April 9, 1917.

Bids were received by the general purchasing officer of the Panama Canal, Washington, March 31, for furnishing supplies under circular 1130, class 7, for one automatic screw machine—Henry Bainbridge & Co., $2,845; Charles H. Graff, $2,514.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until date not set, schedule 913, for various pneumatic chipping hammers, jam riveters and pneumatic holders-on, for several navy yards; schedule 914, for 17 tool-room screw-cutting lathes, ten 16-in. tool-room extension base shaping machines and 9 drill presses, all for Brooklyn; schedules 914 and 928, for 19 motor-driven bench type 12 x 1¼-in., emery grinding machines for Brooklyn, and for Portsmouth and Puget Sound respectively; schedule 921, for one upright drill, one double spindle or column grinding machine, one extension-gap or double spindle lathe and one tool-room column shaping machine, all for Charleston; schedule 928, for four 16-in.-swing wood-working lathes and two 12-in. motor-driven saw tables for Puget Sound and Portsmouth respectively.

The following bids were received by the chief of the Bureau of Yards and Docks, Navy Department, Washington, April 2, for furnishing and installing electric traveling cranes:

Item 1—One 150-ton, one 20-ton, two 15-ton, and one 5-ton cranes complete, in accordance with specifications; 2, one 150-ton crane complete; 3, two 150-ton cranes complete; 4, two 15-ton, one 20-ton and one 5-ton cranes complete; 5, each additional 15-ton crane; 6, each additional 20-ton crane; 7, each additional 5-ton crane.

The Cleveland Crane & Engineering Company, item 2, $94,830, 300 days; 3, $189,660, 350 days.

The Penn Bridge Company, item 1, $140,336, delivery for 150-ton cranes 400 days; other cranes, 300 days. Item 2, $90,496, 400 days; 3, $176,992, 490 days; 4, $49,840, 300 days; 5, $13,033, 30 days additional for each crane; 6, $12,688, 30 days additional for each crane; 7, $7,255, 30 days additional for each crane.

Manning, Maxwell & Moore, Inc., New York. Item 1, $129,342, 350 days; 2, $77,028, 350 days; 3, $150,056, 380 days; 4, $48,176, 275 days; 5, $13,954, 300 days; 6, $11,594, 300 days; 7, $8,094, 300 days.

The Alliance Machine Company, Alliance, Ohio, item 1, $111,000, 350 days.

The Morgan Engineering Company, Alliance, Ohio, item 1, $174,175, 270 days; 2, $114,875, 270 days; 3, $218,750, 300 days; 4, $59,300, 270 days; 5, $16,575, 270 days; 6, $13,950, 270 days; 7, $10,600, 270 days.

An agreement has been made by the Massachusetts Institute of Technology with the United States Smelting, Refining & Mining Company whereby the latter is to avail itself of the laboratory facilities offered by the institute instead of establishing a research laboratory of its own. To carry on the special work which this co-operation necessitates the Institute of Technology has named Henry M. Schleicher, a graduate of 1910, to be research associate in charge of the work, the general direction resting on Prof. H. O. Hoffman, professor of metallurgy, in charge of the department of mining and metallurgy.

The movement in Great Britain to bring about the use of the metric system, carried on by the Decimal Association, has led to emphasis on the fact that the proposed bill there provides that nothing shall affect manufacturing of articles according to measures other than those of the metric system. It is explained that while buying and selling in metric quantities would be required, the British could continue to use existing weights and measures for manufacturing until such time as they chose to amend them.

To expedite repairs on the coal-handling equipment at the Cristobal coaling station, Panam Cnl Zone, mchine shop is being erected 36 x 94 ft., one story, including a blacksmithing department and an air compressor section. The equipment includes a radial drill, 20-in. and 36-in. lathes, a shaper and accessories. Heavy repairs will continue to go to the large shops of the mechanical division.

NEW TRADE PUBLICATIONS

Turret Lathes.—Gisholt Machine Company, Madison, Wis. Pamphlet. Shows by a number of reprints of advertisements that have appeared in the trade and technical journals the character of work handled on turret lathes. In each case a view of the operation being performed, a dimensioned drawing of the piece and a brief statement of the special features of the work are given, together with the length of time require for doing it, the last being rendered quite prominent by the use of heavy type.

Divided Machine Vises.—Schuchardt & Schütte, 90 West Street, New York City. Circular. Treats of a vise for use on the tables of planing, milling, shaping, drilling and slotting machines which is made in two units, designed to be placed one at each end of the piece of work that is to be held. The vises are claimed to be capable of holding heavy and light work up to the full length of the table of the machine on which they are employed, as well as parallel, taper or irregular shaped articles, this result being secured by a combined parallel and downward movement of the jaw which forces the work down to the table or parallels, thus eliminating the use of a hammer to insure the work being properly bedded to its support. A number of views of the vise, which is made in three different sizes, in position on various metal-working machines, are included.

Light Motor Trucks.—Napoleon Motor Car Company, Napoleon, Ohio. Circular. Illustrates a 1000-lb. light delivery truck. Among the advantages claimed are a low gear ratio and the ability to cover five times the area possible with a team of horses at no greater cost. A table of specifications of the truck is presented.

Soot Blowers.—Diamond Power Specialty Company, Detroit. Bulletin No. 125. Pertains to the application of Diamond soot blowers to the boilers of the Babcock & Wilcox Company. A statement explaining why the blowers were adopted is presented, followed by descriptive matter regarding the application of the blower. The text is supplemented by numerous engravings including one of the 2365-hp. installation made at the Detroit Edison Company's Connors Creek plant.

Wrought-Iron Pipe.—Reading Iron Company, Reading. Two pamphlets. One lists additional instances of the durability of wrought-iron pipe and shows the condition of a set of wrought-iron pipes that had been in use for eight years in connection with a dry air plant at a blast furnace and the steel fittings. A number of views showing the appearance of the two kinds of pipe are presented. The other pamphlet calls attention to a vanishing-thread joint for signal and rotary drill pipe which starts with several threads of the full depth and continues with the same pitch and taper as the regular pipe thread until the outside of the thread disappears at the outer surface of the pipe. The advantages of this type of joint are briefly touched upon and a number of engravings showing the condition of standard and vanishing-thread joints after being subjected to torsion tests are included.

Drilling Machines.—Langelier Mfg. Company, Providence. Catalog. Calls attention to a line of high-speed belt-driven ball bearing drilling machines of the manufacturing type. There is practically no text in the circular, engravings of the various machines with specifications and dimension tables being relied upon to tell the story. Considerable useful information for the guidance of inquirers and purchasers is included.

Universal Turret Lathe.—Foster Machine Company, Elkhart, Ind. Pamphlet. Embodies in a single piece of descriptive literature illustrations, specifications and complete description of a universal turret lathe and the various tools and attachments supplied for it. The description of the lathe, which is built with either bar or chucking equipment, is supplemented by engravings of the various parts and a view of the lathe with all the different features indicated is included. The description of the attachments and tools is a feature of the pamphlet, each attachment or tool being given a separate paragraph with an engraving, brief description and list of the various modifications that can be supplied as well as the code words for each.

Tool and Cutter Grinding Machines.—Acme Grinder Company, Cincinnati. Circular. Gives general description and specifications for a universal tool and cutter grinding machine which, in addition to sharpening all styles of milling cutters, reamers, end mills, counterbores, gages, etc., is adapted for all classes of general purpose work. The description is complete but concise. It is grouped in a series of short paragraphs with the name of the part covered in contrasting type as a side head.